DOCUMENT RESUME

ED 265 139 SP 027 053

TITLE	Medication Administration Program for Unlicensed Personnel. A State Approved Program.
INSTITUTION	Minnesota Curriculum Services Center, White Bear Lake.
SPONS AGENCY	Minnesota State Dept. of Health, St. Paul.
PUB DATE	83
NOTE	237p.
AVAILABLE FROM	Minnesota Curriculum Services Center, 3554 White Bear Ave., White Bear Lake, MN 55110, Catalog number B 0625 ($10.00).
PUB TYPE	Guides - Non-Classroom Use (055) -- Guides - Classroom Use - Materials (For Learner) (051) -- Tests/Evaluation Instruments (160)
EDRS PRICE	MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	*Allied Health Occupations Education; *Drug Education; *Medical Services; Medical Vocabulary; Paraprofessional Personnel; *Pharmacology; Technical Education

ABSTRACT

This text and course are intended to assist the trained medication aide in administering medications properly, safely, and effectively. There are six comprehensive units for instruction and reference: (1) legal requirements; (2) general drug information; (3) medical abbreviations and symbols and the medication order; (4) use of medication references; (5) body and drug systems; and (6) the administration of medications. Each unit is preceded by a key words section defining words, abbreviations, or phrases used in that unit. An introduction then provides the rationale for the unit. Essential information is found in the body of each unit. Finally, practice worksheets are available to assist the learner in using knowledge and skills in an exam-like situation. (JD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

SCOPE OF INTEREST NOTICE
The ERIC Facility has assigned this document for processing to:

In our judgment, this document is also of interest to the Clearinghouses noted to the right. Indexing should reflect their special points of view.

ED265139

Medication Administration Program for Unlicensed Personnel

"PERMISSION TO REPRODUCE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

P. Fehler

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

A state-approved program
Minnesota Department of Health

SP 027 053

B 625

© 1983 COPYRIGHT

1553
7851000

Production: Brown, Jensen and Garloff, Inc.
Minneapolis, MN
Copyright ©1983, Minnesota Department of Health.
Illustrations from *The Anatomy Coloring Book*
by Wynn Kapit and Lawrance M. Elson
(Barnes & Noble) reprinted with permission of
Harper & Row, Publishers, Inc.

The Minnesota Curriculum Services Center is supported by the State of Minnesota Department of Education and the State Board of Vocational Technical Education. The MCSC does not discriminate on the basis of race, color, creed, religion, sex, national origin, marital status, status with regard to public assistance or disability.

MINNESOTA CURRICULUM SERVICES CENTER
3554 White Bear Ave White Bear Lake, MN 55110
(612) 770-3943 800-652-9024

Goals, Objectives, Principles, Organization

Goal

This text and course are intended to assist the trained medication aide in administering medications properly, safely, and effectively.

Objectives

Following completion of this course, the TMA will be able to

1. identify various legal requirements (state and national) concerning drugs and drug administration, such that he/she understands and can apply these laws, rules and regulations in his/her employing institution.

2. explaining the intended effects of medications, their forms, kinds of doses, and major channels of administration.

3. translate the more commonly used medical abbreviations with their English meanings, either by supplying the meaning for the abbreviation, or the abbreviation for the meaning.

4. use an accepted drug reference, such as *Physician's Desk Reference* or the USPDI to state the classifications of drugs, indications or purposes for use, side effects or adverse reactions, special considerations and adult dosages.

5-1. identify ten major body systems according to anatomy, physiology, and pathology, and which systems are involved in the pharmacology of drug use.

5-2. from a list of drugs provided, explain their purpose, other names (e.g. trade), desired action, side-effects, and adverse reactions.

6. safely administer medications by oral, rectal, and topical routes.

Guiding Principles

1. when in doubt, ask for assistance!

2. understand your own competencies and responsibilities, so as to *not* perform activities beyond your own limitations as a TMA.

Organization of Text

This text is divided into units. Each unit is preceded by a Key Words section, that defines words, abbreviations, or phrases used in that unit. An Introduction then provides the rationale for the unit. Essential information is found in the body of each unit. Finally, practice Worksheets are available to assist the learner in using his/her knowledge and skills in an exam-like situation.

Guiding Principles of Medication Administration*

The following principles of sound practice should apply in all care facilities in which the administration of medications has been delegated by the physician to the registered nurse.

1. All medications which are administered must have been ordered by a podiatrist, physician, osteopath or dentist. Administration of medication should be considered as one part of a total plan of care.

2. Patient safety and well-being is the primary consideration in medication administration. Security of controlled substances is another major consideration.

3. Medication administration must be carried out in accordance with policies established by the facility/agency, those policies to include statements about which personnel may administer which medications and under what conditions.

4.** Only nursing personnel, not other categories of employees, should administer medications.

5. Each person administering a drug must know the drug's intended use, usual dose and symptoms of hypersensitivity or overdose. Persons administering medications must have had special, competent training in the technique.

6. A licensed nurse should be responsible for observations regarding effect, side effects and integration of drug therapy into the plan of care.

7. Medications should be removed from a previously dispensed container and recorded on the permanent record by the same person who gives them to the patient/resident.

8. Drugs should be administered as soon as possible after doses are prepared.

9. Patients must be identified prior to the administration of a drug.

10. Medication errors should be reported to the prescribing person as soon as possible.

*Source: These principles were developed by the Minnesota Nurses Association.

**This is not true in *all* circumstances. In some instances, other categories of trained personnel (e.g. physical therapists) may administer medications.

Table of Contents

Goals, Objectives Principles, Organization i
Guiding Principles of Medication Administration ii
Table of Contents iii

UNIT I—LEGAL REQUIREMENTS 1

Key Words 1

Legal Requirements 3
  Introduction, Authority and Responsibility 3
  Use of Initials, Overview of Legal Requirements 4
  Regulations for Different Units: NH, MR, CD 5
  Distinctions for Medications 6

Federal Regulations That Apply to All Institutions 7
  The Controlled Substance Act of 1970 7
  The Food and Drug Act 8

Laws and Regulations for Nursing Homes 11
  Federal Register 11
  Minn. Dept. of Health Reg. #53 12

Laws, Rules and Regulations for Mental Retardation Units 19
  Federal Register 19

MDH Regulations for Mental Retardation and Chemical Dependency Units 25
  MHD #397 25
  MHD #398 26

General Information on Classification of Controlled Substances (Schedules I—V) 29

Worksheets for Unit I 30

UNIT II—GENERAL DRUG INFORMATION 35

Key Words 35

General Information 39
  Introduction, Background 39
  Forms of Medication 39
  Drug Effects; Kinds of Doses, e.g. Minimum to Lethal 42
  Major Routes 44

Routes of Administration: Diagrams 45
  Oral 45
  Topical—Rectal 46
  Inhalation. Vaginal—Urethral 47
  Parenteral 48

Worksheets for Unit II 49

UNIT III—MEDICAL ABBREVIATIONS AND SYMBOLS; AND THE MEDICATION ORDER 51

Key Abbreviations and Symbols 51

Medication Orders 55

Medical Abbreviations 59
  Introduction 59
  Forms 59
  Routes; Times 60
  General Abbreviations and Symbols 61
  Roman numerals/Arabic numbers 62

Worksheets for Unit III 63

UNIT IV—USE OF MEDICATION REFERENCES 69

Key Words 69

Use of Medication References 71
  Introduction, PDR and USPDI 71
  Naming of Drugs 72
  The PDR 73
  The USPDI 74
  General Dosing Information 75
  Example: Using the PDR and USPDI 76
  Major Categories of Medications 77
  Common Side Effects 78
  Assignment 79
  Medication Classifications—Assignment #1 with Examples 80
  Assignment #2 81
  Examples I and II 82
  Using a Medication Reference as a Problem Solver 83

Worksheets for Unit IV 85

UNIT V BODY SYSTEMS AND DRUG SYSTEMS 89

Key Words 89

Overview of Body Systems 95
- Introduction; Mortality and Morbidity, Aging 95
- Single Cells to Complex Structures 96
- Body Systems 97

Part 1: An Examination of the Body Systems 99
- Skeletal System 99
- Muscular System 99
- Nervous System 100
- Circulatory (Cardiovascular) System 103
- Respiratory System 107
- Reproductive System 108
- Urinary System 110
- G-I System and Accessory Organs 110
- Endocrine System 112
- Skin 114
- Eye/Ear 115
- Diagrams of Various Systems 117
  - Skeletal 117
  - Muscular 118
  - Nervous 119
  - Circulatory 120
  - Respiratory 121
  - Reproductive 122
  - Urinary 123
  - G-I 124
  - Endocrine 125
  - The Skin 126
  - Eye/Ear 127
- Pharmacology and the Body 128

Unit V, Part 1 Worksheets 131

Part 2: Drug Classifications 137
- Introduction 137
- Side Effects/Adverse Reactions 137
- Preventing Adverse Reactions 138
- Use of the Drug Chart 139
- Comparison of Math and Drug Knowledge 140
- Dealing with Drug Reactions 141

- Medication Charts 142
  - Analgesics 142
    - Narcotic/Non-narcotic
  - Antacids 143
  - Antianxiety 143
  - Antiasthmatic 144
  - Antibacterial 144
    - Antibacterial/ophthalmic 145
    - Adrenocorticoid otic 145
  - Anticoagulant 145
  - Anticonvulsant 146
  - Antidepressant 147
  - Antidiabetic agent 147
  - Antidiarrheal agent 147
  - Antifungal 147
  - Antihistamine 148
  - Antiparkinsonism agent 148
  - Antipsychotic/antimanic 149
  - Bronchodilator/Albuteral 150
  - Cardiovascular 150
    - Diuretic
    - Vasodilator
  - Expectorant 151
  - Laxatives 152
    - Stimulant
    - Stool softener
    - Bulk forming
  - Pedicalicide/Scabicide 153
  - Potassium Supplements 153
  - Sedative—Hypnotic 154
  - Topical Steroid 154

Worksheets for Unit V, Part 2 155

UNIT VI—THE ADMINISTRATION OF MEDICATIONS 161

Part I: Written Procedures 161

- Introduction, Written Procedure for Medication Administration, Delivery System: Traditional and Unit Dose 161
- Unit Dose Systems 162
- Forms/Components of Unit Dose Systems and Guidelines for Administering Medications 163
- Safety in the Skill of Administering Oral Medications 166
- Definition of Dose Preparation Standard 167

Procedure to Administer Oral Meds (General) and General Recommendations 168
Step-Wise Procedure for Oral Meds 169
Procedure for Topical Medications 170
Procedure for Rectal Medication 172
Procedure for Topical Meds: Eye Drops 174
Procedure for Topical Meds: Eye Ointment 175
Procedure for Topical Meds: Ear Drops 177

Part II: Charting 179
Legal Considerations 179
The Chart: What is It?/The Medication Record 180
General Rules 184
Rules of Charting—Summary 185

Part III: Errors in Medication Administration 187
Reporting Errors 187
What to Do When an Error Occurs 188
Assignment 188

Part IV: Clinical Evaluation Checklists 193
Facility Directions for Use of Clinical Evaluation Checklists 193
Directions for Use of Checklist 194
Checklist for Reporting Errors in Medication Administration and Lawful Charting 195
Checklist: Admin of Oral Medications 197
Checklist: Admin of Topical Medications: Eye Ointment 199
Checklist: Admin of Topical Medications: Eye Drops 201
Checklist: Admin of Topical Medications: Ear Drops 203
Checklist: Admin of Topical Medications: Skin Medications 205
Checklist: Admin of Rectal Medications 207
Follow-up 209
Self-Administration; Refusal of Medication and/or Treatment 210

APPENDICES 211

Advisory Committee 211

Common Stems 211

Common Prefixes 213

Common Suffixes 217

Self-Administration Guidelines—A 218

Major Categories of Medications—B 220

References—C 222

Certificate/Inventory and Destruction of Controlled Substances—D 223

Disposition of Controlled Substances 224

Index 225

Unit I
Key Words

A course of action which includes the complete procedure of (1) checking the patient's record, (2) transferring individual doses of the medication from the patient's prescription container, (3) distribution to the patient, and (4) recording of all medications given in the patient's chart.	**Administration of Medications**
A synthetic powerful central nervous system stimulant. Abuse may lead to dependence.	**Amphetamine**
A policy whereby a resident's medication is automatically discontinued after a certain period of time, if the physician has not ordered it to be administered for a specific length of time.	**Automatic Stop Order**
A substance that induces sleep and has sedative effects.	**Barbiturate**
A drug made from living organisms and their products; these include serums (e.g. antiserums used to type blood), or vaccines.	**Biological**
A collection of informational sheets and forms relating to an individual's care.	**Chart (or Record or File)**
Any substance under a Federal Classification system in which drugs found to be habit forming are assigned a level of classification from I - V, depending on their potential for abuse. (I = greatest potential for abuse.) "Controlled Substances" include all narcotics, stimulants, depressants and other drugs of abuse contained in the Federal Controlled Substances Act of 1970 (Public Law 91-513) or Chapter 937, Minnesota Session Laws of 1971.	**Controlled Substance**
Something that lowers vital processes. (Also defined as agent that will depress a body function or nerve activity).	**Depressant**
A substance used externally or internally to: 1. prevent disease (or) 2. aid in the diagnosis of a disease (or) 3. treat a disease (or) 4. restore normal functioning of body tissue (or) 5. maintain normal functioning in body tissues.	**Drug (Medication)**
To insert a substance beneath the skin. (Not permitted to be performed by TMAs).	**Hypodermic**
A written rule established by a government and applicable to its people.	**Law**
A drug for which a prescription is required; a prescription drug.	**Legend Drug**
An RN or LPN.	**Licensed Nurse**
See "Drug".	**Medication**

Narcotic	A drug that relieves pain, causes sedation and induces sleep (or unconsciousness). A narcotic such as morphine is addictive. Another definition for narcotic: a drug that acts on the central nervous system to produce euphoria (a false sense of well-being), drowsiness or stupor. A narcotic's use is subject to government control because it is dangerous and can cause dependence or addiction.
Over-the-Counter Drug	A drug that can be obtained without a prescription, e.g., aspirin.
Poison	A substance that can destroy life or impair health, e.g., arsenic.
Proof-of-Use System	A pharmacy-based drug control system which allows multiple dose distribution for selected controlled drugs which are accounted for by a certified disposition record completed by the nurse and filed in the pharmacy to account for drugs administered.
Regulation	An outgrowth of a law, in which the standards, principles, and methods are set forth to provide the details of how a law is to be carried out.
Sedative	An agent that quiets activity, (e.g., Phenobarbital).
Stimulant	An agent that temporarily increases some vital process, e.g., coffee, or methylphenidate.
Transcription	The act or process of transferring a physician's (dentist's) order from the Order Sheet to the Kardex, med card or the like. The original order from the doctor may be verbal or written.
Unit Dose System	A system of medication dispensing in which each dose is individually packaged and marked by the manufacturer and/or pharmacist with the 1. patient's name. 2. medication's name. 3. strength of medication. 4. time of medication. 5. route.

Unit I
Legal Requirements

Introduction

Laws, regulations, statutes, ordinances, policies and procedures—why are they important? What purpose do they serve? Each of us likes to think we are humane, knowledgeable, competent, and careful; thus, may be tempted to ask, "Why do we need all of these rules? I probably could provide better care without them." Nevertheless, laws, regulations and the like seek to protect each of us in our dealings with others.

A law is a written rule established by a government and applicable to its people. This definition contains two elements: first a rule, and second, an agreement by members of a society to follow the rule. A regulation is an outgrowth of a law, in which the standards, principles, and methods are set forth to provide the details of how a law is to be carried out. Legal restrictions may be established by the federal government through laws and regulations, by the state government through statutes, regulations and rules, and by local governments through ordinances. All, then, serve as protection from actions which society has agreed to be undesirable.

To gain a fuller appreciation of the necessity for rules and regulations, consider what would happen if:

—there were no traffic laws; no licensing requirements to drive a car; no insurance provisions?

—there were no rules governing patient/resident care in health care facilities?

In short, laws specify acceptable ways to behave with other members of society, and impose penalties on those determined to be transgressors.

Authority and Responsibility

One of the most important lessons for every staff member to learn is where his/her limitations of authority and responsibility lie. On entering a new job—even if it is really a familiar job, but with a new employer—nearly everyone feels insecure and tentative in working with the patients or residents. As time passes, confidence grows, and the person may feel confidence and security beyond his/her training and abilities. Such a situation could have dangerous consequences, both for the patient/resident or for the worker.

All unlicensed staff members* must remember that they are paraprofessionals. That is, they are trained to work in some areas independently, and in other areas, under the guidance of professionals. In the area of medication administration, the licensed nurse (RN or LPN), or the physician must provide guidance and supervision. While the training of paraprofessionals should be sufficient for the procedures that they perform routinely, they must *never* attempt to perform tasks for which they are not trained. They may not perform certain other tasks if the required level of supervision is not present. (Note: an instructor will review the limitations of TMA responsibility in administering medications, as determined by laws, regulations, and standards of acceptable practice).

---

*Unlicensed persons are those staff members who have not passed a "licensure" examination. Nurses, physicians, dentists, pharmacists, or physical therapists are licensed by the state. Other professionals such as occupational therapists, medical technologists, or dieticians may be "certified by" a national certification agency. TMAs are considered unlicensed personnel.

Restrictions on staff are determined by

- legal restrictions (laws, rules and regulations)
- standards of professional practice
- individual facility policies.

The first two will be discussed in class. Each facility also has its own policies and specific job descriptions, as well as other determinants for the scope of employees' responsibilities. Thus, while a TMA may be trained to administer certain medications, if the employing institution has policies *against* having TMAs administer medications, the institution's policies stand.

Each person, then, who gives care has the obligation to know his/her limitations (by legal restrictions, standards of professional practice, or individual facility policies), and must not exceed them. WHEN IN DOUBT, ONE MUST SEEK PROFESSIONAL ASSISTANCE.

Use of the Initials "CMA" or "TMA"

Successful completion of this course is *not* equivalent to either licensure, certification or registration as a medication technician or aide. Therefore, initials such as "C.M.A." (Certified Medication Aide) are misnomers (named in error). All trained medication aides (TMAs) must practice under the *delegation* of an RN, with *supervision* likewise provided by a licensed nurse (RN or LPN). Licensed nursing personnel have the responsibility of supervising and providing regularly-scheduled evaluation for all TMAs.

The Minnesota Department of Health encourages the use of the initials TMA (Trained Medication Aide) as well as semi-annual reevaluation of all TMAs in an institution. Signed copies of clinical evaluations—which are available from the Department—should be retained in the TMAs personnel file. In addition, all recently-employed TMAs should be assessed as to their capabilities, prior to being assigned to administer medications.

An Overview of Legal Requirements

Laws, rules, and regulations provide restrictions on how persons may behave toward others in given situations. For example, each health care worker is responsible and accountable for all actions in providing services to patients or residents. Laws seek to protect the resident or client, and the health care worker also, by establishing standards of practice as well as licensing requirements. Even though one must learn specific procedures in administering medications, there also is concern as to the threat of medico-legal problems that could arise in one's daily work. To intelligently carry out medication orders, all personnel assigned these duties must know the legal requirements under which they must function.

This unit contains the laws, rules, and regulations that are pertinent to (1) nursing homes (NH) including intermediate care facilities and skilled facilities; (2) mental retardation (MR) units; and (3) chemical dependency (CD) units. Some laws are common to all three, such as the Controlled Substance Act of 1970, and the Food and Drug Act. Others are specific to each kind of facility. Listed below are pertinent laws, rules, and regulations for each kind of residence.

Nursing Homes are regulated by

The Controlled Substance Act of 1970
The Food and Drug Act
Excerpts: Federal Register
Minnesota Department of Health Reg. #53 (until July, 1983; this Reg. then becomes 7MCAR S1.053N thereafter).

Mental Retardation Units are regulated by

The Controlled Substance Act of 1970
The Food and Drug Act
Excerpts: Federal Register
Minnesota Department of Health Reg. #397; #398

Chemical Dependency Units are regulated by

The Controlled Substance Act of 1970
The Food and Drug Act
Minnesota Department of Health Reg. #397, #398

To aid in learning, pertinent laws, rules and regulations for each of these institutions will be color coded in the following manner:

1. white—laws and regulations pertaining to all three kinds of facilities (Controlled Substance Act and Food & Drug Act).
2. yellow—laws and regulations for nursing homes (Intermediate Care Facilities & Skilled Care Facilities).
3. blue—laws, rules, and regulations for mental retardation units
4. green—MDH regulations #397 and #398 for mental retardation units and chemical dependency units.

The Minnesota State Department of Welfare may include regulations to medication administration in their program rules in mental retardation and chemical dependency units.

Remember this general principle: if a conflict exists between two (or more) regulations, such as those by federal and state governments, the more (most) stringent will apply. Also, laws pertaining to drugs and their administration may change with time; therefore, some of what is learned today may not be true later on. An instructor will provide current information; a consulting pharmacist for your facility should keep you updated by providing your facility with changes in the law.

Important Distinctions for Medications (Drugs)	Medication (Drug)	Any substance used internally or externally in the care, treatment, lessening, or prevention of disease in man and other living organisms.
	Over-the-Counter Drugs	(OTC) drugs which may be obtained without a prescription.
	Legend Drugs	drugs which require a prescription; prescription drugs.
	Controlled Substances	drugs which are classified and regulated by the D.E.A. in one of five schedules, based on their perceived abuse potential. (See pg. 29 of this unit).

Federal Regulations That Apply to All Institutions

The Controlled Substance Act of 1970

This Act was originally the Harrison Narcotic Act of 1914, and regulated the importation, manufacture, sale, dispensing or prescribing, and use of opium, cocaine, and all of their derivatives. In 1956, an amendment to this act provided more effective control of narcotic drugs and marijuana. All heroin for example, must be surrendered to the Federal Government. The Act provides strict penalties for persons over 18 years of age who give, sell, or dispense narcotics to juveniles. The Act was updated in 1970; it is regulated by the Drug Enforcement Administration (DEA). See page 13 of this unit for the Minneapolis address of the DEA. The following provisions of this Act are important:

1. The Controlled Substances Act of 1970 regulates the importation, use, sale, manufacture, and distribution of narcotics*, barbiturates**, amphetamines*** and other dangerous drugs.
2. This Act licenses those who manufacture, sell at wholesale, prescribe, or dispense those medications, known as controlled drugs, which fall under this Act.
3. Under the Act, medications are categorized into five schedules. These schedules are based on the medication's potential for abuse, schedule I drugs having the highest potential, and schedule V the lowest. Schedule I drugs are generally not available for use except in research under a special permit.
4. Not all drugs requiring a prescription are considered to be controlled drugs.
5. The Pharmacist who dispenses a controlled drug must attach a label to the prescription container bearing the statement: "Caution: Federal Law prohibits the transfer of this drug to any person other than the patient for whom it was prescribed."
6. All physicians (i.e., Medical Doctors or Doctors of Osteopathy), Dentists, Veterinarians, Podiatrists and Pharmacies must be registered by the DEA in order to prescribe or dispense controlled drugs. In addition, each prescriber must be registered with the appropriate licensure boards.
7. A prescription for a controlled substance must be issued for a legitimate medical purpose by a practitioner acting in the usual course of his professional practice.
8. Controlled drugs may not be disposed of except in the manner prescribed by the DEA.

---

*A narcotic is a drug that acts on the central nervous system to produce euphoria (a false sense of well-being), drowsiness or stupor (unconsciousness). A narcotic's use is subject to government control because it is dangerous and can cause dependence or addiction.

**A barbiturate is a general name for any substance used for its hypnotic (sleep-inducing) and sedative effects.

***An amphetamine is a synthetic powerful central nervous system stimulant. Abuse may lead to dependence.

The Food and Drug Act

The first Food and Drug act was passed by Congress in 1906, to enforce standards for drugs involved in interstate commerce. This act named the **United States Pharmacopeia** and the **National Formulary** as official drug standards. The 1906 Act required for example that the contents of the container conform with the label statement. The 1906 law proved to be inadequate; and in 1938, a new law was enacted having a much broader scope. Since that time, the law has had several amendments set forth. The Food and Drug Act is now enforced by the Food and Drug Administration of the Department of Health and Human Services (HHS); formerly the Department of Health Education and Welfare. The law now includes three official drug standards, the **United States Pharmacopeia**, the **National Formulary** and the **Homeopathic Pharmacopeia of the United States**.

Food and Drug Act

These regulations control the importation, use, sale, manufacture and distribution of all non-controlled drugs in the United States. The following provisions of this act are important.

1. The Food and Drug Administration (FDA) requires drug manufacturers to prove the value and safety of new drugs before they are released for sale, either with or without a prescription.

2. The Food and Drug Act governs which drugs may be sold with or without a prescription. The use of any drug carries with it some degree of danger: no drug is harmless. Those drugs sold without a prescription have been proved safe for use with most, but not necessarily all people, when used in accordance with the label directions.

3. The word drug (i.e., medication) means any substance used internally or externally in the cure, treatment, prevention or lessening of disease in man or other living organisms.

4. Drug container labels must state contents in understandable words.

5. Container labels must include clear directions for use of the medication.

6. Certain drugs are available only with a prescription.

7. Records of Controlled Substances (Schedules II - V) purchased and dispensed must be kept by the holder of the pharmacy license. Prescriptions for Schedule II drugs cannot be refilled unless the pharmacist obtains a new, signed, prescription. Schedules III - V have a five-refill or six-month limitation.

8. All non-prescription (i.e., over-the-counter) medications must be labeled with the name of the medication, the strength, quantity and average directions for use.

9. Prescriptions for medications other than narcotics and dangerous drugs can be refilled only on order from the prescriber.

Federal Regulations of DEA

Controlled Substance Act of 1970

Regulates the importation, use, sale, manufacture and distribution of narcotics, barbituates, amphetamine, and other dangerous drugs.

Regulatory Agency –

Drug Enforcement Administration (DEA)

Licenses those who manufacture, sell, prescribe and dispense controlled drugs.

Categorizes controlled substances into 5 schedules: Schedule I, highest potential for abuse, to Schedule V, with lowest potential for abuse.

Dictates & Regulates:
1. Caution label.
2. Registration of all M.D.s, O.D.s, Dentists, Vets, Podiatrists, and Pharmacists.
3. Disposition of controlled drugs.

Federal Regulations of FDA

Food, Drug and Cosmetic Act
(1906 & 1938)

Regulates importation, use, sale, manufacture & distribution of all non-controlled drugs in the United States.

Regulatory Agency –

The Food and Drug Administration (FDA)

1. Governs which drugs will be sold with or without a prescription.
2. Approves USP/NF.
3. Requires accurate labeling & warnings against unsafe use.

Drug manufacturers must register with the FDA. Requires manufacturers to prove the value & safety of new drugs before they are released for sale, either with or without a prescription.

Dictates wording of drug container on both prescription & nonprescription drugs.

Note: Food & Drug Administration is under the Department of Health and Human Services.
Drug Enforcement Administration is under the Department of Justice.

Courtesy of:
Georgia Pomroy/Sue Garrison
Minneapolis Technical Institute
1415 South Hennepin
Minneapolis, MN

Laws and Regulations for Nursing Homes

Federal Register

1. **Intermediate Care Facilities** - (January 17, 1974) 249.12 (8) (I-VI) Vol. 39 - No. 12.

(I) If the facility does not employ a licensed pharmacist, it has formal arrangements with a licensed pharmacist to provide consultation on methods and procedures for ordering, storage, administration and disposal and recordkeeping of drugs and biologicals:

(II) Medications administered to a resident are ordered either in writing or orally by the resident's attending or staff physician. Physician's oral orders for prescription drugs are given only to a licensed nurse, pharmacist, or physician. All oral orders for medication are immediately recorded and signed by the person receiving them* and are countersigned by the attending physician in a manner consistent with good medical practice:

(III) Medications are not specifically limited as to time or number of doses when ordered are controlled by automatic stop orders or other methods in accordance with written policies and the attending physician is notified:

(IV) Self-administration of medication is allowed only with permission of the resident's attending physician:

(V) A registered nurse reviews monthly each resident's medications and notifies the physician when changes are appropriate. Medications are reviewed quarterly by the attending or staff physician: and

(VI) All personnel administering medications must have completed a State-approved training program in medication administration.

Federal Register, Medicaid Regulations, 442.337, Administering Medications, Friday, September 29, 1978, Part V, Vol. 43, No. 190.

442.337 Administering Medications

(a) Before administering any medication to a resident, a staff member must complete a State-approved training program in medication administration.

(b) The ICF may allow a resident to give himself a medication only if the attending physician gives permission.

2. **Skilled Facilities**

FEDERAL REGISTER 405.1124 Condition of participation--nursing services. 39 Federal Register 2244, January 17, 1974; 39 Federal Register 35776, October 3, 1974.

(g) STANDARD: ADMINISTRATION OF DRUGS. Drugs and biologicals are administered only by physicians, licensed nursing personnel, or by other personnel who have completed a State-approved training program in medication administration. Procedures are established by the pharmaceutical services committee (see 405.1127(d)) to ensure that drugs to be administered are checked against physicians' orders, that the patient is identified prior to administration of a drug, and that each patient has an individual medication record and that the dose of drug administered to that patient is properly recorded therein by the person who administered the drug. Drugs and biologicals are administered as soon as possible after doses for administration, except under single unit dose package distribution systems (See 405.1101(h)).

---

*Transcription is the act or process of transferring a doctor's order from the Order Sheet to the Kardex, medicine card or the like. The doctor's original order may be verbal or written.

(h) STANDARD: CONFORMANCE WITH PHYSICIANS' DRUG ORDERS. Drugs are administered in accordance with written orders of the attending physician. Drugs not specifically limited as to time or number of doses when ordered are controlled by automatic stop orders or other methods in accordance with written policies. Physicians' verbal orders for drugs are given only to a licensed nurse, pharmacist, or physician and are immediately recorded and signed by the person receiving the order. (Verbal orders for Schedule II drugs are permitted only in the case of a bona fide emergency situation.) Such orders are countersigned by the attending physician within 48 hours. The attending physician is notified of an automatic stop order prior to the last dose so that he may decide if the administration of the drug or biological is to be continued or altered.

(I) STANDARD: STORAGE OF DRUGS AND BIOLOGICALS. Procedures for storing and disposing of drugs and biologicals are established by the pharmaceutical services committee. In accordance with State and Federal laws, all drugs and biologicals, are stored in locked compartments under proper temperature controls and only authorized personnel have access to the keys. Separately locked, permanently affixed compartments are provided for storage of controlled drugs listed in Schedule II of the Comprehensive Drug Abuse Prevention & Control Act of 1970 and other drugs subject to abuse, except under single unit package drug distribution systems in which the quantity stored is minimal and a missing dose can be readily detected. An emergency medication kit approved by the pharmaceutical services committee is kept readily available.

(39 FR 2244, January 17, 1974; 39 FR 35776, Oct. 3, 1974)

Minnesota Department of Health Reg. No. 53

MHD 53 Medications

Please Note: These regulations have been in effect for Nursing Homes only, until July 1, 1983. Effective this date, changes in regulation can be seen at the end of this section. The following apply to Nursing Homes only:

(A) Administration of Medications. A system shall be developed in each nursing home to assure that all medications are administered safely and properly. The supervising nurse or other nursing staff trained specifically by the supervising nurse or a physician in the administration[1] of medications and familiar with the expected action of drugs,'shall be designated and held responsible for the administration of medications during each eight hour period. A list of carefully selected personnel, currently employed, who have been so trained, none under eighteen (18) years of age, shall be maintained. The written training program shall be available at each nursing station. Medications administered by hypodermic* may be given only be a physician, registered nurse or licensed practical nurse. Administration shall include the addition of medications to

---

*Hypodermic means introducing a substance (e.g. a drug) underneath the skin, as via a hypodermic needle. A medications aide may *not* administer medications via the hypodermic route.

[1] Administration of medications include the complete procedure of: (1) checking the patient's record, (2) transferring individual doses of the medication from the patient's prescription container, (3) distribution to the patient and (4) recording all medications given on the patient's chart.

food when patients require assistance with eating. The actual act of swallowing oral medications shall be observed personally by the individual responsible for administering medications. When medications have been added to food, the amount of food consumed shall be recorded by the person designated to administer medications. All medications shall be administered exactly as ordered by the physician. Any medication errors or patient reactions[2] shall be reported to the physician at once and any explanation made in the patient's care record.

(1) All medications, including those brought into the nursing home by the patient, shall be administered only on a written order signed by a licensed physician or dentist except that orders may be given by telephone provided that such orders are authorized by the physician or dentist, recorded by the person so authorized and signed by the physician or dentist within seven (7) days. The charge nurse and the attending physician together shall review each patient's medications and treatments at least every three (3) months.

(2) Stock supplies of legend[3] drugs may be kept on the premises only within a licensed pharmacy. Legend drugs are dispensed from a pharmacy only: (a) On an individual prescription basis, (b) Through a unit dose dispensing system[4] approved by the Minnesota State Board of Pharmacy, or (c) On a proof-of-use system[5] in a convalescent and nursing care unit of a hospital when the hospital has a licensed pharmacy dispensing controlled substances.[6]

---

[2] It is recommended that all adverse drug reactions be reported to the Adverse Drug Reaction Registry of the American Medical Association, 535 North Dearborn Street, Chicago, IL., 60610 or to the Food and Drug Administration, 240 Hennepin Avenue, Minneapolis, Minnesota, 55414.

[3] Legend drugs include those obtainable only on prescription.

[4] "Unit dose dispensing system" utilizes unit dose packaging in a pharmacy-based distribution system which insures the identity and integrity of the drug dosage form up to the point of patient consumption. The traditional nursing act of "setting up" medications is accomplished in the pharmacy from which doses are distributed according to the pre-determined schedules.

[5] A "proof-of-use" system is a pharmacy-based drug control system which allows multiple dose distribution for selected controlled drugs which are accounted for by a certified disposition record completed by the nurse and filed in the pharmacy to account for drugs administered.

[6] "Controlled Substances" include all narcotics, stimulants, depressants and other drugs of abuse contained in the Federal Controlled Substances Act of 1970 (Public Law 91-513) or Chapter 937, Minnesota Session Laws of 1971.

(Note:
A stimulant is somthing that temporarily quickens some vital process. Ex: coffee or tea, as well as some drugs.
A depressant is something that lowers vital processes.
A sedative is an agent that quiets activity, ex: phenobarbital.)

(3) Medications procurable without (which do not require a) prescription may be retained in stock supply. These shall be dated on receipt to prevent the accumulation of out-dated or deteriorated items.

(4) For use in emergencies only, a licensed physician may maintain a minimum supply of medications in the nursing home provided the responsibility for the contents, maintenance, safeguarding and usage of this emergency supply is fully assumed in writing by the physician. This emergency supply shall be kept in a separate, labeled container in the locked medicine cabinet or locked medicine room.

(5) In no case shall a prescription drug supply for one patient be used or saved for the use of other patients in the nursing home.

(B) Medicine cabinet and preparation area. A well-illuminated medicine cabinet shall be provided on each nursing station. The medicine cabinet shall be equipped with separate cubicles which are plainly labeled, or provided with other physical separation for the storage of each patient's prescriptions. A medicine preparation area shall be provided in a location that is quiet, convenient for the nursing staff and separate from all soiled activities. All medications shall be prepared in such preparation area. Graduated medicine containers for the accurate measurement of liquid medications shall be provided. If not disposable, these medicine containers shall be returned to the institution dishwashing unit for processing after each use. All narcotics shall be placed under double lock. This shall be accomplished by maintaining a separate, permanently attached compartment with a tumblered key lock within the locked medicine cabinet or locked medicine room. The medicine cabinet, medicine refrigerator or medicine room shall be kept locked when not in use. The keys shall be carried on the person designated to administer drugs and be available only to those persons who are authorized to administer drugs. All drugs shall be stored in medicine cabinets. The cabinet shall be kept clean and orderly at all times and shall be used only for the storage of drugs.

(1) Poisons* and medications intended for external use only shall be clearly so marked and shall be kept in a separate locked compartment.

(2) Biologicals** and other medications requiring refrigeration shall be kept in a refrigerator within the medication room or in a specially locked, securely attached, and labeled, impervious container in a general use regrigerator.

(3) All substances, such as cleaning agents, bleaches, detergents, disinfectants, pesticides, paints and flammable liquids shall be clearly labeled and stored separately from all drugs and foods.

All disposable equipment (for example, syringes and needles) shall be rendered inoperable prior to disposal, unless incinerated. Medicine droppers and similar equipment shall be thoroughly cleaned and then sterilized before each use by one of the following methods:

---

*A poison is a substance that can destroy life or impair health. Ex: arsenic.

**A "biological" is a drug made from a living organism or its product; it may include serums (e.g. antiserums used to type blood), or vaccines, or similar products.

(AA) Dry heat at 170°C. (338°F.) for not less than one hour.

(BB) Autoclaving at 15 pounds pressure and 120°C. (248°) for 20 minutes.

(CC) Boiling for not less than 30 minutes after the boiling temperature has been reached.

(C) Medication containers. All medications shall be kept in their original container bearing the original label with legible information stating the prescription number, name of drug, strength and quantity of drug, expiration dates of all time-dated drugs, directions for use, patient's name, physician's name, date of original issue or in the case of a refill, the most recent date thereof and name and address of the licensed pharmacy which issued the medications. It shall be the responsibility of the nursing home to secure the prescription number and name of the medication if these are not on the label.

(1) Any drug container having detached, exessively soiled or damaged labels shall be returned to the issuing pharmacy for relabeling.

(2) The contents of any drug container having no label or with an illegible label shall be destroyed immediately.

(3) Medications having a specific expiration date shall not be used after the date of expiration.

(D) Record of Medications and Narcotics. All medications administered to each patient shall be recorded on the medication and treatment record or in the nurses' notes on the patient's chart.* This information shall include the name and quantity of the drug given and the time administered and shall be initialed by the person giving the drug. Special notations shall be made whenever medications are started or discontinued. Medicine cards or a medicine list shall be maintained to show each medication which is currently being given.

All narcotics and other controlled subtances and antihistamines** shall have their prescription number entered on the nursing record each time a new prescription is received. Records of receipt and distribution of controlled subtances shall be maintained by either of the following methods:

(1) A narcotic record book consisting of bound notebook with numbered pages and containing a record of the name and the quantity of all narcotics recieved, dates received as well as a record of the patient to whom the narcotics are given. It shall also include the prescription number, date and time administered, name of prescribing physician and signature of person who administered the drug.

(2) a proof-of-use system in a convalescent and nursing care unit of a hospital when the hospital has a licensed pharmacy.

---

*Chart - a collection of informational sheets and forms related to an individual resident's (patient's) care. Also called record or file.

**While not in State law, the State Board of Pharmacy advises that since combinations of antihistamines and controlled substances are no longer manufactured, that portion of the law is no longer enforced.

Each time a controlled substance is given it shall be recorded on the patient's chart. In addition, the supervising nurse shall record and sign the narcotic count at least once every day. When a loss or spillage of a prescribed narcotic occurs, an explanatory notation shall be made on the patient's chart and in the narcotic record book. This notation shall be signed by the person responsible for the accident and by one witness who shall also observe the destruction of any remaining contaminated drug by flushing into the sewer system.

(E) Automatic "stop orders". Medications not specifically limited as to time or number of doses when ordered, shall be automatically stopped in accordance with a written policy approved by the physician(s) responsible for advising the nursing home on its patient care policies.* The patient's attending physician shall be notified of stop order policies a short time before a medication order expires so that the medications are renewed when necessary and the continuity of the patient's therapeutic regimen is not interrupted.

(F) Disposition of medications. If authorized by the attending physician or the physician in charge, medications belonging to patients shall be given to them when discharged or transferred. This shall be recorded on the patient's chart. Unused portions of controlled substances shall be handled by contacting the Bureau of Narcotics and Dangerous Drugs.** The Bureau will furnish the necessary instructions and appropriate forms, a copy of which shall be kept on file in the home for two years. Any other unused portions of prescription drugs remaining in the nursing home after the death or discharge of the patient for whom they were prescribed or any prescriptions discontinued permanently shall be destroyed by the supervising nurse in the nursing home, by flushing them into the sewer system and removing and destroying the labels from the containers. A notation of such destruction giving date, quantity, name of medication and prescription number shall be recorded on the patient's chart. Such destruction shall be witnessed and the notation signed by both persons.

(G) Pharmacies in Nursing Homes. No pharmacy shall be maintained as part of any nursing home unless it is licensed by the Minnesota State Board of Pharmacy and complies with all its statutes and regulations governing such licensures and operation.

(H) Medication References. The nursing home shall maintain current medication references and other printed sources of information.***

---

*See MHD 45 (h7).

**U.S. Courthouse, 811 Grand Avenue, Suite 225, Kansas City, Missouri, 64106. Under no circumstance should controlled subtances be forwarded to the Bureau without prior communication with the Bureau relative to the necessary instructions and surrender forms. (Editor's note: The Bureau of Narcotics and Dangerous Drugs is now called The Drug Enforcement Administration (DEA) and such unused portions of controlled substances shall be returned to the DEA Regional Office at 402 Federal Building, 110 So. 4th Street, Minneapolis, Minnesota, 55401.)

***Examples include: 1)the ASHP Hospital Formulary Service, a current standard text book on pharmacology and similar references. 2) the Physician's Desk Reference (PDR). 3) the USPDI - Drug Information for the Health Care Provider.

CHANGES EFFECTIVE JULY 1, 1983
The new regulation is called MDH 7 MCARR, S1.053N (Note: final numbers are the same).

THE FOLLOWING APPLIES TO BOTH NURSING HOMES AND BOARDING CARE HOMES: Unlicensed nursing personnel who administer medications in a nursing home or boarding care home must have completed a mediction administration training program for unlicensed personnel in nursing homes which is offered through a Minnesota postsecondary educational institution. The nursing home or boarding care home shall keep written documentation verifying completion of the required course by all unlicensed nursing personnel administering medications.

Laws, Rules and Regulations for Mental Retardation Units

Federal Register
Long-term care facilities for the mentally retarded wishing to receive reimbursement, for their services to residents, under Title 18 and/or 19 must become Federally certified as ICF/MR facilities and meet Federal Regulations published in the **Federal Register**. Excerpts follow.

Federal Register - September 29, 1978. Medicaid Regulations Reorganization and Rewriting, Vol. 43, No. 193, p. 45250. Standard: 442.484. The facility implements methods and procedures relating to drugs and biologicals which assure that:

(i) If the facility does not employ a licensed pharmacist, it has formal arrangements with a licensed pharmacist to provide consultation on methods and procedures for ordering, storage, administration and disposal and recordkeeping of drug and biologicals;

(ii) Medications administered to a resident are ordered either in writing or orally by the resident's attending or staff physician. Physician's oral orders for prescription drugs are given only to a licensed nurse, pharmacist, or physician. All oral orders for medication are immediately recorded and signed by the person receiving them and are countersigned by the attending physician in a manner consistent with good medical practice;

(iii) Medications not specifically limited as to time or number of doses when ordered are controlled by automatic stop orders or other methods in accordance with written policies and the attending physician is notified;

(iv) Self-administration of medication is allowed only with permission of the resident's attending physician;

(v) A registered nurse reviews monthly each resident's medications and notifies the physician when changes are appropriate. Medications are reviewed quarterly by the attending or staff physician; and

(vi) All personnel administering medications must have completed a State-approved training program in medication administration.

Note: To this point, these regulations are the same as those for Nursing Homes.

(9) Provides health services which assure that each resident receives treatments, medications, diet, and other health services as prescribed and planned, all hours of each day, in accordance with the following:

(i) Immediate supervision of the facility's health services on all days of each week is by a registered nurse or licensed practical (or vocational) nurse employed full-time on the day shift in the intermediate care facility and who is currently licensed to practice in the State: Provided, That:

(A) In the case of facilities where a licensed practical (or vocational) nurse serves as the supervisor of health services, consultation is provided by a registered nurse, through formal contract, at regular intervals, but not less than 4 hours weekly;

(B) By January 1975, licensed practical (or vocational) nurses serving as health services supervisors have training that includes either graduation from a State approved school of practical nursing or education and other training that is considered by the State authority responsible for licensing of practical nurses to provide a background that is equivalent to graduation from a State approved school of practical nursing, or have successfully completed the Public Health Service examination for waivered licensed practical (vocational) nurses; and

(C) Other categories of licensed personnel with special training in the care of residents may serve as charge nurse: Provided, That such person is licensed by the State in such category following completion of a course of training which includes at least the number of classroom and practice hours in all of the nursing subjects included in the program of a State approved school of practical (or vocational) nursing as evidenced by a report to the single State agency by the agency or agencies of the State responsible for the licensure of such personnel comparing the courses in the respective curricula; and

(ii) Responsible staff members are on duty and awake at all times to assure prompt, appropriate action in cases of injury, illness, fire, or other emergencies;

(iii) In the case of institution for the mentally retarded or persons with related conditions, with less than 15 beds, which has only residents certified by a physician as not in need of professional nursing service, paragraph (a) (9) (i) and (ii) of this section may be met if the institution arranges through formal contract for the services of a registered nurse or public health nurse to visit as required for the care of minor illnesses, injuries, or emergencies, and consultation on the health aspects of the individual plan of care; and if a responsible staff member is on duty at all times who is immediately accessible, to whom residents can report injuries, symptoms of illness, and emergencies;

(iv) A written health care plan is developed and implemented by appropriate staff for each resident in accordance with instructions of the attending or staff physician. The plan is reviewed and revised as needed, but not less often than quarterly;

(v) Nursing services are provided in accordance with the needs of the residents and, in the case of a facility other than an institution for the mentally retarded or persons with related conditions, restorative nursing care is provided to each resident to achieve and maintain the highest possible degree of function, self-care and independence.

Federal Register - January 17, 1974, Volume 39, Number 12, Pages 2226, 2230. 249.13 Standard: for intermediate care facility services in institutions for the mentally retarded or persons with related conditions. (1977 Regulations)

Effective not later than 3 years after the effective date of these regulations the standards for intermediate care facility services (as defined in ss 249.10 (b) (15)) in an institution for the mentally retarded or persons with related conditions which are specified by the Secretary pursuant to section 1905 (e) and (d) of the Social Security Act and referred to in ss 249.10 (c) (6), are specified in this section. At such time as an institution is deemed to meet the standards contained in this section, such institution will no longer be required to meet the following provisions of ss 249.12: (a) (1) (i), (ii), (iv), (v) and (vi); (a) (4); (a) (6) (i) (B), (iii), (v), (vi), (vii), and (viii); (a) (7), (a) (8); (c) (4); and (c) (5).

(6) Nursing services.

(i) Residents shall be provided with nursing services in accordance with their needs.

(ii) Nursing services to residents shall include as appropriate:

(A) Registered nurse participation in:

(1) The preadmission evaluation study and plan;

(2) The evaluation study program design, and placement of the resident at the time of admission to the facility;

(3) The periodic reevaluation of the type, extent and quality of services and programming;

(4) The development of discharge plans; and

(5) The referral to appropriate community resources;

(B) Training in habits in personal hygiene, family life, sex education (including family planning and venereal disease counseling);

(C) Control of communicable diseases and infections through:

(1) Identification and assessment;

(2) Reporting to medical authorities; and

(3) Implementation of appropriate protective and preventive measures;

(D) Development of a written plan for each resident to provide for nursing services as a part of the total rehabilitation program; and

(E) Modification of the nursing plan, in terms of the resident's daily needs at least annually for adults and more frequently for children, in accordance with developmental changes.

(iii) A registered nurse shall participate, as appropriate, in the planning and implementation of training of facility personnel. Direct-care personnel shall be trained in:

(A) Detecting signs of illness of dysfunction that warrant medical or nursing intervention;

(B) Basic skills required to meet the health needs and problems of the residents; and

(C) First aid in the presence of accident or illness.

(iv) There shall be available sufficient appropriately qualified nursing staff, which may include currently licensed practical nurses and other supporting personnel to carry out the various nursing services activities. The individual responsible for the delivery of nursing services shall have knowledge and experience in the field of developmental disabilities.

(v) Nursing service personnel at all levels of experience and competence shall be:

(A) Assigned responsibilities in accordance with their qualifications;

(B) Delegate authority commensurate with their responsibility; and

(C) Provided appropriate professional nursing supervision.

(7) Pharmacy services.

(i) Pharmacy services shall be provided under the direction of a qualified licensed pharmacist. There shall be a formal arrangement for qualified pharmacy services, including provision for emergency service, by means appropriate to the facility.

(ii) There shall be a current pharmacy manual that;

(A) Includes policies and procedures, and defines the functions and responsibilities relating to pharmacy services; and

(B) Is revised annually to keep abreast of current developments in services and management techniques.

(iii) There shall be a formulary system approved by the responsible physician and pharmacist, and by other appropriate facility staff. Copies of the facility's formulary and of the American Hospital Formulary Service shall be located and available, as appropriate to the facility.

(iv) Upon admission of the resident, a medication history of prescription and nonprescription drugs shall be obtained where possible, preferably by the pharmacist, and this information shall be entered in the resident's record for the information of the staff. The pharmacist shall:

(A) Receive the original, or a direct copy, of the physician's drug treatment order;

(B) Maintain for each resident an individual record of all medications (prescription and nonprescription) dispensed, including quantities and frequency of refills;

(C) Participate, as appropriate, in the continuing interdisciplinary evaluation of individual residents for the purposes of initiation, monitoring, and follow-up of individualized rehabilitation programs; and

(D) Establish quality specifications for drug purchases, and insure that they are met.

(v) A pharmacist or RN shall regularly review the record of each resident on medication for potential adverse reactions, allergies, interactions, contraindications, rationality and laboratory test modifications, and advise the physician of any recommended changes with reasons, and with an alternate drug regimen.

(vi) Written policies and procedures that govern the safe administration and handling of all drugs shall be developed by the responsible pharmacist, physician, nurse and other professional staff, as appropriate to the facility. There shall be a written policy governing the self-administration of drugs, whether prescribed or not. The compounding, packaging, labeling, and dispensing of drugs, including samples and investigational drugs, shall be done by the pharmacist, or under his supervision, with proper controls and records. Each drug shall be identified up to the point of administration. Wherever possible, drugs that require dosage measurement shall be dispensed by the pharmacist in a form ready to be administered to the resident.

(vii) Medications shall not be used by any resident other than the one for whom they were issued. Only appropriately trained staff shall be allowed to administer drugs.

(viii) Drugs shall be stored under proper conditions of sanitation, temperature, light, moisture, ventilation, segregation, and security. All drugs shall be kept under lock and key except when authorized personnel are in attendance. The security requirements of Federal and State laws shall be satisfied in storerooms, pharmacies, and living units. Poisons, drugs used externally, and drugs taken internally shall be stored on separate shelves or in separate chabinets, at all locations. Medications that are stored in a refrigerator containing things other than drugs shall be kept in a separate compartment with proper security. If there is a drug storeroom separate from the pharmacy, there shall be a perpetual inventory of receipts and issues of all drugs by such storeroom.

(ix)* Discontinued and outdated drugs, and containers with worn, illegible, or missing labels, shall be returned to the pharmacy for proper disposition.

(x) There shall be automatic stop orders on all drugs. There shall be a drug recall procedure that can be readily implemented. Medication errors and drug reactions shall be recorded and reported immediately to the practitioner who ordered the drug. There shall be a procedure for reporting adverse drug reactions to the Federal Food and Drug Administration.

(xi) There shall be an emergency kit readily available to each living unit and constituted so as to be appropriate to the needs of its residents.

---

*Note: Please note this is different from MHD #53, which states:

(1) Any drug container having detached, excessively soiled or damaged labels shall be returned to the issuing pharmacy for relabeling.

(2) The contents of any drug container having no label or with an illegible label shall be destroyed immediately.

MDH Regulations for MR and Chemical Dependency Units

MHD 397 Resident's Health Record

Supervised Living Facilities shall maintain a resident's health record for each resident. It may be contained in a general resident record.

(a) **Required Data.** Basic health information to be maintained in each resident's health record shall include:

(1) identifying information: name, previous address, date of admission and discharge, person to contact in an emergency;

(2) the physician responsible for his/her medical care as designated by the resident or guardian;

(3) the name of the resident's dentist as designated by the resident, parent, or guardian; dates of dental examinations and treatments; special instructions for care and oral hygiene as recommended;

(4) adverse reactions to drugs recorded and prominently posted as a precaution;

(5) where professional therapy services are provided to the resident, regular notations regarding the resident's progress in such therapies;

(6) dates and descriptions of all illnesses, accidents, treatments thereof, and immunizations, including examinations required in MHD 396;

(7) summary of hospitalizations, to include recommendations for follow-up and treatment; and

(8) where the resident is being treated through a special diet, a copy of the diet, length of time to be used, prescription signed by the supervising physician, and the dates of review of the diet;

(b) **Nature of Health Record.**

(1) Upon request, a resident or parent or guardian shall be provided with a summary of the resident's health record within a reasonable period of time following discharge.

(2) All information contained in the resident's health records shall be considered priviliged and confidential, and written consent of the resident or his parent shall be required for the release of information to persons not otherwise authorized to receive it. The resident shall have access to the health record upon request.

(3) All entries in the resident's health record shall be legible, dated and authenticated by the signature and other identifying designation of the individual making the entry.

(c) **Retention of Health Record.** All resident Health Records shall be kept by the facility for at least three years following discharge or death. Employees of the department may review such records for accuracy and completeness.

MHD 398 Medication Handling Procedures

(a) **Control of Medications.** Facilities shall develop and adhere to a written medication control plan acceptable to the Board. The plan shall be on file and available for inspection. The plan shall contain at least the following provisions:

(1) a statement of: whether the staff will administer medications, how the staff will supervise self-administration of medications, whether medications will be self-administered, or a combination of the above systems;

(2) how the distribution and storage of medications will be handled, including a description of suitable storage facilities;

(3) if the facility has both staff-administered and self-administered medications, the plan shall specify who will determine which system each resident will use;

(4) procedures for recording medications that residents are taking;

(5) procedures for periodic examination and review of medication regimens;

(6) procedures for storage of prescription and non-prescription medications;

(7) method of refrigeration of biologicals.

(b) **Handling of Medications**. Stock supplies of prescription medications shall not be maintained in a Supervised Living Facility. Staff may administer prescription medications which can be safely self-administered only to residents for whom the medication is ordered by a physician. In no case shall such medications be maintained, distributed, or administered from containers other than individual prescription containers bearing appropriate labels.

(c) **Medication Containers**. All prescription medications shall be kept in their original container bearing the original label with legible information stating the prescription number, name of drug, strength and quantity of drug, expiration date of all time-dated drugs, directions for use, resident's name, physician's name, date of original issue or in case of a refill, the most recent date thereof and name and address of the licensed pharmacy which issued the medications. It shall be the responsibility of the facility to secure the prescription number and name of the medication if these are not on the label.

(1) Any drug container having detached, excessively soiled or damaged labels shall be returned to the issuing pharmacy for relabeling.

(2) The contents of any drug container having no label or with an illegible label shall be destroyed immediately.

(3) Medications having a specific expiration date shall not be used after the date of expiration.

(d) **Record of Medications**. All prescribed medications and comfort drugs used by each resident shall be recorded on the resident's health record. This information shall include the name and quantity of the drug prescribed. Special notations shall be made whenever medications are started or discontinued. Adverse reaction to a medication, and the report to the physician of the same, shall be recorded.

(e) **Disposition of Medications.** If authorized by the attending physician or the resident's physician, medications belonging to residents shall be given to them when discharged or transferred. This shall be recorded in the resident's health record. Unused portions of controlled substances shall be handled by contacting the Minnesota State Board of Pharmacy, which will furnish the necessary instructions and appropriate forms, a copy of which shall be kept on file in the facility for two years. Any other unused portions of prescription drugs remaining in the facility after the discharge of the resident for whom they were prescribed, or any prescriptions discontinued permanently, shall be destroyed by the licensee or designee by flushing them into the sewer system and removing and destroying the labels from the containers. A notation of such destruction giving date, quantity, name of medication and prescription number shall be recorded on the resident's chart. Such destruction shall be witnessed and the notation signed by both persons.

General Information on Classification of Controlled Substances

The drugs controlled by the Drug Enforcement Administration (D.E.A.) have been relegated to five schedules with the greatest restrictions in Schedule I down to the least in Schedule V. This is a brief summary.

Schedule I

Drugs with high potential for abuse that have no established medical use. These drugs are available for research only, and then only by investigators approved by both the D.E.A. and the FDA who must also approve the investigators protocols. Among the drugs included are LSD, mescaline, peyote, heroin.

Schedule II

Drugs with high potential for abuse do have established medical uses. Regulations on these drugs include among others: record keeping by all prescribers, manufacturing quotas, no verbal prescriptions, no refills, special security provision. Drugs in this group are the former Class A narcotics (morphine, codeine, hydromorphine, etc.), the amphetamines, methylphenidate, and phenmetrazine.

Schedule III

Drugs with less potential for abuse than those in Schedule II, but more than those in Schedule IV. Regulations include among others: prescriptions limited to five refills, and they must be filled or refilled within 6 month; inventory and other record keeping by manufacturers, distributors, and regular dispensers. In Schedule III are the former Class B narcotics containing limited amounts of narcotics; short acting barbiturates; paregoric; and trade names as Empirin #3, Doriden, Noludar, Lotusate, Pre-Sate, Copavin, Ambenyl, Robitussin AC, and most cough preparations containing codeine.

Schedule IV

Drugs with less potential for abuse than those in Schedule III, but more than those in Schedule V. There are no major differences between the regulations in Schedules III and IV. Drugs in this group are: chloral hydrate; long acting barbiturates (phenobarbital), and trade names as Valium, Darvon, Placidyl, Equagesic, and Meprobamate.

Schedule V

Drugs with a low potential for abuse relative to the drugs in Schedule IV. These drugs may be dispensed without a prescription by a pharmacist in limited amounts to purchasers over 18 who must be recorded. (Minnesota laws prohibit such dispensing without a prescription.) There are few other restrictions. Included in this schedule are products containing limited amounts of narcotics, such as some cough syrups. Trade names: Lomotil, Parapectolin, Donnagel PG. The latter two drugs are **non**-prescription drugs in Minnesota.

Codeine-containing cough syrups are **not** Schedule V drugs under Minnesota law but are listed in Schedule III, thus requiring a prescription.

Worksheet: Unit I

Open Book Exam

Directions: Select the response which completes each statement most accurately. There is only one best answer for each question. You may use your text. Answer all questions from the viewpoint of a trained medication aide (TMA).

1. Under Minnesota state law (MHD 53 A), which of the following is permitted to train unlicensed staff in the administration of medications?
   A. another TMA
   B. the supervising nurse or a physician
   C. the local vocational school
   D. none: unlicensed staff may not administer medications in Minnesota.

2. State law tells us how old a person must be to administer medications in nursing homes. Such a person must be at least
   A. 16 years old
   B. 18 years old
   C. 20 years old
   D. 21 years old

3. Your nursing home does **not** have a licensed pharmacy on the grounds. Which of the following medications may it lawfully keep in stock supply?
   A. Darvon - a Controlled substance
   B. Robitet - a legend drug
   C. Escot - an OTC medication
   D. Penicillin G Procaine - a prescription drug

4. Liquid medications are given in your facility. State law says that the facility must provide
   A. disposable teaspoons for measurement
   B. plastic cups for measurement
   C. prescription bottles with markings on the side for measurement
   D. graduated medicine containers for accurate measurement

5. A resident receives only two medications: Halog, an external drug, and Librium, an oral medication. Where must the Halog be stored?
   A. separately from the oral medication
   B. with the oral medication
   C. external meds can only be stored in a licensed pharmacy
   D. as close to the resident as possible; e.g. at his bedside table

36

6. Which of the following is true, according to the Food and Drug Act?

   1. medication container labels must state contents in understandable words.
   2. container labels must include clear directions for use
   3. Over-the-counter medications must be labelled with the drug's strength
   4. container labels must indicate the patient's diagnosis

   A. 1,2 and 3 are correct
   B. 1 and 3 are correct
   C. 4 only is correct
   D. All are correct

7. A container of Talwin has the following label attached: "CAUTION: federal law prohibits the transfer of this drug to any person other than the patient for whom is was prescribed." From this information, you can correctly conclude that Talwin is . . .

   A. for external use only
   B. subject to abuse
   C. an OTC medication
   D. in Schedule I of the Controlled Substances list

8. According to ICF (Intermediate Care Facility) regulations, if the staff believes that a resident is capable of self-administration of medications, who must give permission before self-administration is allowed?

   A. the physician
   B. the administrator
   C. the supervising nurse
   D. the resident's legal guardian

9. To whom may a physician give verbal orders for prescription drugs?

   1. to an RN
   2. to an LPN
   3. to a pharmacist
   4. to a TMA

   A. 1, 2, and 3 are correct
   B. 1 and 3 are correct
   C. 4 only is correct
   D. All are correct

10. If you administer a medication, who must document this act in the resident's medication record?

    A. you
    B. the charge nurse
    C. the pharmacist
    D. the facility's administrator

Closed Book Exam

Directions: Select the response which best completes each statement. There is only one best answer is each case. You must score at least 90% correct to pass. No reference material is permitted.

1. A resident has difficulty taking her Niferex-PN, a rather large tablet. It is decided that this tablet should be ground-up and added to some applesauce. When you administer this concoction, you (must, need not) record the amount eaten.

2. Your administrator wishes to keep stock supplies of Riopan, at OTC antacid. Legally, he (may, may not) do this.

3. Due to a shortage of space, it is decided that the medications area and the dirty utility room shall be combined so that both activities can take place in a single room. This decision is (acceptable as long as a written policy exists to support it; unacceptable under state nursing home regulations).

4. Your facility has only one set of keys to the medication room. Who must carry them?
   A. the facility's administrator
   B. the director of nursing
   C. the charge medication aide
   D. the person designated to administer drugs

5. A soiled label from a prescription bottle (can, cannot) be replaced by you.

6. A resident requests that you give him some Di-Gel for his sour stomach. This preparation can be obtained by anyone without a prescription. In the nursing home, a current physician's order (must be, need not be) written for the Di-Gel before it may be administered.

7. A registered nurse is in a rush. She asks you to administer a certain medication by injection. You (must not, may) do this.

8. A drug container has no label. According to MDH 53, the contents must be (destroyed immediately, returned to the issuing pharmacy).

9. The medication room or cabinet (shall be, need not be) locked.

10. The narcotic book (must, need not) have numbered pages.

Extra Credit

11. A drug container has no label. According to the Federal Register governing intermediate care facilities for the **mentally retarded** (442.484 Standard), the contents must be (destroyed immediately, returned to the issuing pharmacy).

Open Book Exam

Key

1. B
2. B
3. C
4. D
5. A
6. A
7. B
8. A
9. A
10. A

Closed Book Exam

1. must
2. may
3. unacceptable
4. D
5. cannot
6. must be
7. must not
8. destroyed immediately
9. shall be
10. must
11. returned to the issuing pharmacy

Unit II
Key Words

The process whereby a drug enters the blood stream, e.g. from the mucosa of the mouth, intestine, rectum, or the like.	**Absorption**
The way a drug produces changes in body cells and tissues.	**Action**
Particles suspended in a gas; usually used for drugs that are inhaled or sprayed on to the skin or mucosa.	**Aerosol**
A substance dissolved in water.	**Aqueous solution**
A route of administration in which a drug is placed and held in the pocket of the cheek until it is dissolved.	**Buccal**
Gelatin container used to encase a drug.	**Capsule**
Strength of a dose preparation. For example, 90% strength is a high concentration; 0.10% is a low concentration.	**Concentration**
An additive effect of a drug that occurs when it is excreted more slowly than it is taken in.	**Cumulative effect**
A specific quantity of drug, e.g. 200 mg. Kinds of doses include the following: Initial Dose—a comparatively large dose given at the beginning of treatment to get an individual under the influence of a drug. Lethal Dose—a dose likely to cause death. Maintenance Dose—a dose given over a period of time to keep an individual under the influence of a drug after this influence has been obtained by initial dosage. When a drug is "maintained," input balances loss. Maximum Dose—the largest amount of a drug that a person can take with safety. Minimum Dose—the smallest amount of a drug that will produce a physiologic effect on a person. Optimum Dose—the dose of a drug that will produce the desired effects without undesired symptoms.	**Dose**
A substance used to do one or more of the following: 1. prevent disease 2. aid in diagnosing disease 3. treatment of disease 4. restore normal functioning 5. maintain normal function	**Drug**
A combination of biological and physical changes that takes place as a result of drug administration.	**Effect of a drug**
Sweetened (e.g. cherry flavored) preparation of a drug in alcohol.	**Elixir**
Coated with a substance that dissolves in the intestine but not in the stomach; or, to prevent irritation to stomach or gastric mucosa.	**Enteric-coated**
A solution or powder obtained by removing and concentrating drug ingredients from a plant or an animal.	**Extract**
How a drug is made physically, e.g. liquid, solid or semi-solid.	**Form (preparation)**
A stiff substance that dissolves in water; used for making capsules.	**Gelatin**

Hypersensitivity	An allergic response to a drug, such as wheezing or a rash; occasionally, hypersensitivity can be fatal, as from anaphylactic shock.
Inhalation	A route of drug administration in which medication is sprayed or inhaled into the nose, throat, and lungs.
Insertion	The act of placing an object into a body cavity, such as placing a suppository into the rectum.
Instillation	The act of placing drops of liquid into the eyes, ears or nose.
Interaction	Two or more drugs reacting together to change their intended effects on the body.
Irrigation	The act of rinsing a body cavity or tube with a solution.
Liniment	An aqueous preparation, that applied topically, with massage, produces heat.
Local effect	Drug action on a relatively confined area, e.g. liniment on a sore muscle.
Lotion	An aqueous preparation used externally, usually for dry skin.
Mixture	A liquid suspension made with undissolved particles.
Mucous membrane	Moist, glossy lining of most tubes inside the body (e.g. the mouth, sinuses, rectum), that allows some substances to pass through into the body tissues.
Ointment	A semi-solid preparation of medication applied locally to the skin or mucous membranes.
Overdose	A dose that is too large for an individual's weight, age, physical condition.
Parenteral	A route of administration that requires use of a needle. Includes intradermal (ID)—between the layers of the skin; subcutaneous (SQ)—just beneath the skin; intramuscular (IM)—into the muscle; intravenous (IV)—directly into the blood stream.
Petrolatum	An ointment base of petroleum jelly (like Vaseline).
Pill	A spherical, solid form of a medication.
Placebo	A drug-free preparation, e.g. a sugar tablet, given as a mock medication.
Saliva	Digestive juice produced by glands inside the mouth to aid chewing and swallowing.
Scoring	Making indented lines on a tablet so that it can be broken into halves or quarters.
Side effect	A natural, predictable and unavoidable effect of a drug that accompanies its principal or intended effect.
Soluble	Capable of being dissolved.
Solution	A liquid such as alcohol or water that contains a dissolved substance.
Spansule	Another name for a timed-release capsule.
Spray	Particles prepared so that they can be administered by an atomizer.
Sterile	Germ-free.
Sub-lingual	A route of administration in which a drug is placed and held under the tongue, where it is dissolved by saliva.

A soft molded drug in a base that melts at body temperature. Used for insertion into the urethra, vagina, or rectum.	**Suppository**
A liquid containing undissolved particles of a drug.	**Suspension**
Sweetened (e.g. cherry flavored) preparation of a drug in water.	**Syrup**
Drug action that acts on an entire system, or even the entire body.	**Systemic effect**
A molded disc of medication and a substance that holds the tablet together.	**Tablet**
The desired effect of a drug—why it was ordered.	**Therapeutic effect**
A drug of several dosages, usually coated by special means, and intended to dissolve at different rates.	**Timed-release (sustained) medication**
A diluted alcoholic extract of a drug.	**Tincture**
A phenomenon that results when more drug is needed to produce an earlier effect. Many drug abusers build tolerance to drugs they have taken for a period of time.	**Tolerance**
Application of a medication to skin or mucous membranes.	**Topical application**
A large flat disc held in the mouth, e.g. for an irritated throat, until it dissolves.	**Troche (lozenge)**

The Key Words above are extensive; many will be repeated and expanded upon in this Unit and Unit V. **Note**

Unit II
General Information

Introduction

To administer medications is a serious responsibility. There are thousands of medications on the market, and each year many new ones are approved for release and use. A TMA, as an individual administering medications, must know the nature of every drug given by him/her.

It is essential to understand the meaning of terms that will be used in this program of study. These terms will also be encountered in one's daily work. The dictionary defines the term drug as a substance or mixture (other than a food) that is used to do one or more of the following:

1. Prevent disease—(e.g., vaccines)
2. Aid in the diagnosing of a disease—(e.g., barium chloride)
3. Treat a disease—(e.g., ampicillin)
4. Restore normal functioning—(e.g., thyroxin)
5. Maintain normal function—(e.g., digitalis)

Background

Drugs are mixed with various ingredients to make them suitable for persons to take. There are ingredients to make oral medications taste all right; other ingredients allow drugs to be applied on the skin or placed into body parts such as eyes, ears or rectum. These combinations of drugs with various ingredients are called drug preparations or forms of medication.

Forms of Medications

Medications are compounded as three basic forms: liquid, solid, and semisolid. The method for administering (e.g. oral or topical) depends on the medication's

*form

*properties

*effects desired

To make liquid preparations, drugs are usually mixed with either water or alcohol, depending on their solubility. That is, sugar dissolves (is soluble) in water, fats dissolve in alcohol. Occasionally, drugs may be mixed with oils. The **concentration** is the strength of a drug; for example, 90% concentration or 0.05% concentration.

If a medication is to be administered orally, it may be in tablet, liquid or powder form. When a licensed nurse gives a medication by injection, it must be prepared as a liquid. The basic forms of medications liquid and solid (and semisolid) are described next.

1. LIQUID PREPARATIONS are those containing a medication which has been dissolved or suspended in a solvent. Two common solvents are water and alcohol.

a. EMULSIONS are mixtures of oil and water. They usually have a milky appearance and tend to separate into layers upon standing for long periods. Emulsions should always be shaken before administering. An example is liquid petrolatum emulsion, **Petrogalar**.

b. SOLUTIONS are formed when one or more drugs are dissolved in an appropriate solvent. When the solvent is water, the solution is said to be an "**aqueous**" solution. If the solvent is alcohol, the solution is called "**tincture**." Examples of aqueous solutions are **Cepacol Mouthwash** and **Hydrogen Peroxide**.

c. MIXTURES OR SUSPENSION result when undissolved medications are mixed with a liquid. The drugs are in the form of fine particles suspended in the liquid. They must be shaken or stirred before being administered. An example is **milk of magnesia**.

d. SYRUPS are liquid preparations of drugs contained in a sweetened aqueous base. An example is Robitussin-AC. Syrups are useful for masking the bitter taste of certain drugs.

e. ELIXIRS are preparations of drugs containing a medication in a flavored, sweetened, **alcoholic base**. For example, **Elixir Terpine Hydrate with Codeine**.

f. TINCTURES are diluted alcoholic extracts of a drug. They vary in strength from 10% to 80% or more. Examples of Tinctures include **Tincture of Benzoin Compound** or **Tincture of Iodine**.

g. SPIRITS are alcohol solutions of volatile oils, or oils that evaporate; e.g. camphor oil with alcohol gives **camphor spirit**.

h. LOTIONS are aqueous preparations of suspended ingredients used externally to treat such skin conditions as dryness. An example is **Dermassage Lotion**.

i. GELS are fine particles mixed with water to form a paste-like material. An example is **Rhuligel**, used to treat minor skin irritations.

j. LINIMENTS are aqueous preparations applied topically, generally with massage. They produce heat with massage. An example of a liniment is **Heet**. Oftentimes, liniments are not recommended for use with the older resident, and, due to thin-skin, may produce burns if given with massage.

k. AEROSOLS, include solid or liquid particles that are suspended in a gas. These are available as three types:

1. Wet or surface aerosols are sprayed onto the skin without touching it. They may contain an antiseptic or an anesthetic.
2. Steam spray aerosols are applied as sprays under pressure. They usually contain body rubbing solutions.
3. Foam aerosols must be shaken prior to administration so the substances are emulsified. They also contain body lotions. An example of an aerosol is **Kenalog**, which is available as a foam.

l. FLUIDEXTRACTS are very concentrated fluid preparations of drugs made by dissolving a crude plant or animal drug in an appropriate solvent. An example is fluidextract of **Cascara**, a laxative. An "extract" itself may be a solution or powder. A powder results when the fluid from a fluidextract is evaporated, leaving the powder.*

m. SPRAYS are drugs prepared so they can be administered by atomizers. Your instructor will demonstrate the use of an atomizer. Sprays are used principally in the treatment of nose, throat and respiratory conditions. An example is **Neo-Synephrine Nasal Spray**.

---

*Note: Tinctures, fluidextracts, elixirs and spirits are highly concentrated forms of drugs. When given internally, they must be measured with care, e.g. with a medicine glass or dropper. Juice or water should be added so the patient drinks a diluted mixture. In addition, they must be stored carefully, with tightly fitting stoppers; otherwise, the fluid may evaporate, or the drug separate out. If so, do *not* use the preparation.

2. SOLID AND SEMI-SOLID PREPARATIONS are forms of medications, such as tablets, capsules and suppositories, which may be used internally as well as externally, depending on the drug agent and the drug form. Drug forms for internal use are the capsules and tablets. For external use, the drug forms include suppositories and ointments. Each of the solid and semi-solid forms will now be described in some detail.

a. **Capsules** are small containers made from gelatin. The medication is placed in the capsule, which readily dissolves in the stomach. Capsules may be either hard or soft. Hard capsules are used to dispense powdered drugs. An example would be **Minocin**. Soft capsules are used to dispense oils or other liquids. An example would be **chloral hydrate**. Sustained release (timed release) forms of drugs are usually contained in a capsule. In this case, very small particles of the drug are coated with compounds which require varying amounts of time to dissolve. This provides for an immediate as well as a sustained effect. A term frequently used for this timed release form is "**Spansule**." **Thorazine** is available in spansule form. Certain tablets are available also in time-release form.

b. **Pills** are globe-shaped (spherical) forms, small enough to be easily swallowed. Pills largely have been replaced by tablets.

c. **Tablets** are the most common form of medication used today. They are small discs containing a medication and a cohesive substance, that holds the tablet together. They are shaped by being pressed into a mold. The color of the tablet is most often due to added coloring, and is generally not due to the nature of the medication present. Thorazine and Feosol are tablets, as are aspirin tablets.

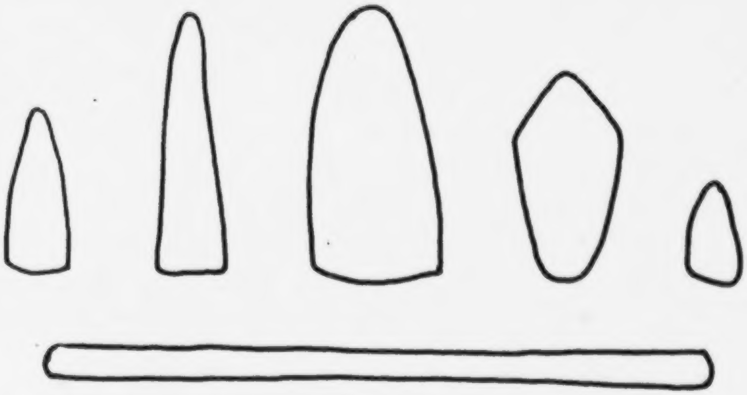
1. **Enteric Coated**. These tablets may be coated either due to their bitter taste or because they are designed to dissolve in the small intestine rather than in the stomach. The enteric coating also prevents an irritating drug from upsetting the stomach. Some **sodium chloride** (common table salt) tablets have an enteric coating.

2. "**Scored**." Scored tablets are marked with indented lines which divide them into halves or quarters. This scoring allows them to be broken easily for administering a proper dosage. **A licensed person will break a scored tablet, if such breakage is indicated**.

d. **Troches** or **lozenges** are large, flat discs that are held in the mouth until dissolved, and used for local effects. An example is **Cepacol lozenges** used in treating throat irritations.

e. **Ointments** are semi-solid preparations of medicinal substances that are applied locally to the skin or mucous membranes. An example of such an ointment is Zinc Oxide Ointment.

f. **Suppositories** are mixtures of drugs in a base that melts at body temperature. The base may be soap, a type of glycerine, or cocoa butter. They are molded into shapes that are suitable for insertion into the rectum, vagina, or urethra. An example of a rectal suppository is **Dulcolax**. **Thorazine** also comes in suppository form. (In this program you will *not* be taught the insertion of either vaginal or urethral suppositories).



Various forms of suppositories: rectal, vaginal and urethral.

Drug Effects

The phrase **drug action** means the way a drug produces changes in body cells and tissues. A **drug effect** is the combination of biological and physical changes that take place as a result of drug administration. A drug is usually prescribed on the basis of its desired or **therapeutic** effect—the reason why the drug was ordered.

Drugs are very useful, but they also can be very dangerous. The doctor or dentist knows the actions of each prescribed drug and is the only person qualified to prescribe how they shall be used. **There is no such thing as a medication that is harmless.**

Medications are prescribed as part of patient or resident treatment, and the doctor regulates the drug dosage to produce a desired effect. Drugs act to increase or to decrease body processes. A quantity of a drug given at one time is called a dose. Kinds of Doses are described below.

Minimum Dose	The smallest amount of a drug that will produce a phsiologic effect on a person.
Initial Dose	A comparatively large dose given at the beginning of treatment to get an individual under the influence of a drug.
Optimum Dose	The dose of a drug that will produce the desired effects without undesired symptoms.
Maximum Dose	The largest amount of a drug that a person can take with safety.
Maintenance Dose	A dose given over a period of time to keep an individual under the influence of a drug after this influence has been obtained by initial dosage. When a drug is maintained, input balances loss.
Lethal Dose	A dose likely to cause death.

The dose is regulated by the physician to produce the desired effect. In this manner the "correct" or optimal dosage is determined. If the "correct" dosage no longer produces a desired effect, the dose will be adjusted, resulting in a new "correct" dosage. For this reason, there is no such thing as an absolutely correct dosage: each depends on the *result* achieved with a particular patient/resident at a specific time. Therefore, observing resident response to drugs is crucial.

Unpleasant or dangerous effects can result from administering too high a dose. No beneficial effect occurs when too low a dosage is administered; in fact, too low a dosage may prove harmful. Unexpected reactions that are *not* due to an overdose of a particular drug can also occur: such a reaction is known as an idiosyncrasy of that drug. An example of such an unexpected, abnormal reaction to a drug would be excitement, rather than relaxation and sleep, following a dose of Nembutal.

Drugs are given for a specific effect.* A predictable effect of a drug, either desirable or undesirable, that accompanies the intended effect for which it was administered, is called a **side effect**. The dry mouth that often accompanies the calming effect of tranquilizers is an example of a side effect, as is colored urine. (See also Unit V).

Drugs are normally metabolized (broken down chemically) and then excreted from the body, some more rapidly than others. (Unit V, Part 2 will discuss this more). Drugs have varying periods of effectiveness in the body, depending on their rate of metabolism, destruction, excretion, or retention. If the drug is administered continously but is excreted (eliminated) more slowly, it accumulates in the body and may produce one or more reactions. These reactions are called **cumulative** effects. Examples include the use of codeine or digitalis which can accumulate in the body.

Another frequently observed effect of drug administration is that of an increased amount of the drug being required to produce the same effect that a lesser amount previously produced. This phenomenon is known as **tolerance**. For example, if an individual takes Valium for a long period of time, he may notice that the dose has to be increased to produce the desired effect: he has built up a tolerance to Valium.

Hypersensitivity to a drug is an allergic response or reaction. For example, an allergic reaction to penicillin may range in severity from a simple rash to an occasional death.

Through error, poor judgment, or attempted suicide, a person may receive a drug **overdose**—a dose that is too large for his/her weight, age, physical condition. This can be dangerous, since it is like poisoning. Symptoms may include slowing of heartbeat, difficulty in breathing, even cardiac arrest. In such a case, emergency measures may be required to keep the person alive, such as supportive equipment; in some cases an antidote may be available. An antidote is a drug that has the opposite effect of another drug, and can reverse the symptoms of the overdose.

---

*One modification is a placebo, a drug-less form of medication, e.g. a sugar tablet, given to someone who believes he/she is getting a "real" drug.

Often, two or more drugs can be given to an individual as a part of drug therapy; or, a person may take a "harmless" over the counter drug along with other legend drugs. Whenever more than one drug is taken, the possibility of **drug interaction** can occur. Drug interaction means that two or more drugs react together to change their intended effects on the body.

When two drugs given together produce a more powerful effect than either of them could produce alone, this is called a synergistic effect. Patients on a sedative such as Valium are told to avoid alcohol, because alcohol causes sedatives to have a stronger (even fatal) effect. When two drugs interact to cause a lessened response than one of them would have been expected to cause, this is caused antagonism. For example, antacids like Gelusil should not be given to persons who are on oral tetracycline (an antibiotic), because antacids hinder the absorption of tetracycline in the intestine.

Major Routes (Channels of Administration)

The route or channel of drug administration is determined by (1) the drug's chemical and physical properties, (2) the site of the desired action and (3) the rapidity of the response to the drug desired. A medication's effect may be **local**, acting on a relatively confined area, or it may be **systemic**, acting on an entire system. Systemic effects are noted only after the medication has been absorbed into the blood and diffused into the tissues.

To achieve a local effect, a medication is applied to the skin or mucous membranes. Neo-Synephrine (nose), Nupercainal (skin), Isoptocarpine (eye), and Auralgan (ear) are all examples of local medications. Such medications are said to be applied "topically." Drugs for topical use are often designed to soothe irritated tissues or to prevent or cure local infections. Topical medications are in the form of creams, liniments, lotions, ointments, liquids, powders or aerosols. Liquids may be sprayed, swabbed, or painted on to desired surfaces.

Topical medications can be dropped or instilled into the eyes, ears and nose (**instillation**); they can be inserted into the vagina, urethra or rectum (**insertion**). Any of these latter areas may also be rinsed with drugs in a solution (**irrigation**). These procedures are generally easy to perform, but correct procedure must be followed to avoid damaging any tissues.

Some forms of medications are rubbed on, patted on, or held on with a bandage. Others may be in the form of "patches" attached to the skin.

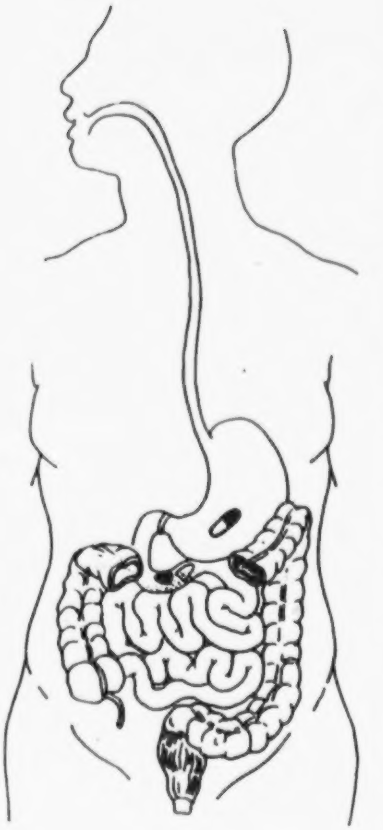
Absorption is the process whereby the drug enters the bloodstream. Speed of absorption is quickest in the following order:

a. Intravenous injection (fastest)
b. Intramuscular injection
c. Subcutaneous injection
d. Oral administration (slowest)

An instructor will explain how these administrations relate to the regulation that requires all medications administered by injection to be given **only** by licensed personnel.

Routes of Administration Diagrams

Oral Route



When given orally, drugs are digested in much the same manner as is food. After being dissolved, oral drugs are absorbed into the bloodstream. Consequently, most drugs given orally have a systemic effect. [Certain drugs are either poorly absorbed or absorbed not at all by the gastrointestinal tract (see Unit V.) In such cases, these drugs can exert a local effect, as their actions are confined to the gastrointestinal tract itself]. Oral adminstration is the easiest, quickest, and most economical way to take medicine. However, it is the slowest way for a drug to reach the body's cells.

Many "untreated" (plain) tablets or capsules begin to be absorbed in the stomach; most absorption, however, takes place in the small intestine.

"Enteric" coated tablets begin to be absorbed in the small intestine. Why is this sometimes desirable?

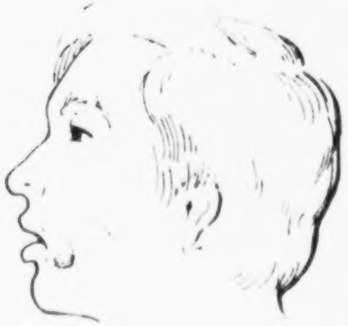
Timed-release (sustained) forms are absorbed slowly, over many hours. These forms contain several doses of medication, each of which is coated by special coatings that dissolve at different rates.

Oral Routes

S - Sublingual

B - Buccal

These two routes are variations on the oral type.



S

Sublingual medications are placed under the tongue, where they are held until dissolved by saliva.

Example:

Nitroglycerin, a drug used to reduce angina chest pains, is frequently given as a sublingual tablet. Another example is Ergostat (ergotamine tartrate) given for migraine headaches.

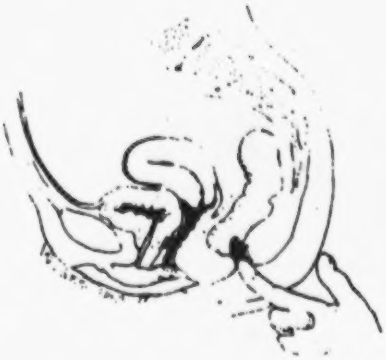
Buccal medications are placed in the pocket of the cheek, between the back of the lower jaw. The drug is absorbed through the mucous membranes that line the inside of the cheek. It should not be swallowed and no food or drink taken until it is dissolved.

Other Routes, e.g. **T-R (Topical-Rectal)**

You will be trained for these routes

Eye—Drugs can be instilled into the eye by means of a dropper (for liquids) or a tube (for ointments).

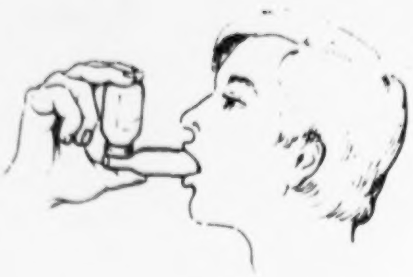
Ear—drugs can be placed into the ear by means of a dropper.



Rectum—drugs can be introduced into the rectum by means of a suppository or a slow enema drip. Absorption through the lining of the rectum is slow and irregular. However, this may be the best route when a patient cannot take medicines orally. Examples include a vomiting patient, or one who is unconscious.

Inhalation

In inhalation administration, medication is sprayed or inhaled into the nose, throat, and lungs. The medication is absorbed through the mucous membranes in the nose and throat, or through the tiny sacs (alveoli) of the lungs.



Medications for this route are in the form of gases or fine droplets—sprays, mists, steam and the like.

Inhalation is widely used for the treatment of asthma symptoms. Special devices such as inhalers or atomizers are available, that make inhalation therapy more convenient than in the past. Because germs can easily enter the body, through the linings of the lungs, the equipment used for inhalation therapy must be exceptionally clean.

Vagina—drugs can be introduced into the vagina by means of a douche, suppositories or special applications.

Urethra—drugs can be introduced into the urethra and bladder by means of slender suppositories or through the means of a catheter.

ONLY

licensed

personnel

will

administer

drugs

by these

routes

P — Parenteral Routes

Any drug route other than the oral route is called "parenteral." Its derivation is from "par" meaning outside, and "enteral" meaning gastrointestinal.

The routes described below are reserved for licensed nurses. A TMA does not administer medications by any of these four routes. Nevertheless, they are included for purpose of information.

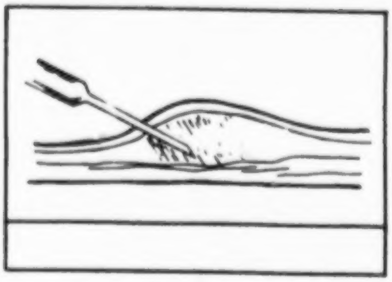


Figure 1. The **Intradermal** route is used frequently for such tests as allergy testing or the tuberculin test. In the ID route, the drug is injected between the layers of the skin.

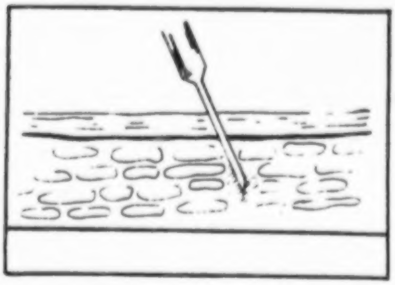


Figure 2. The **subcutaneous** route is just beneath the skin, into the fatty layer. The SQ route is used, for example, for local anesthetics.

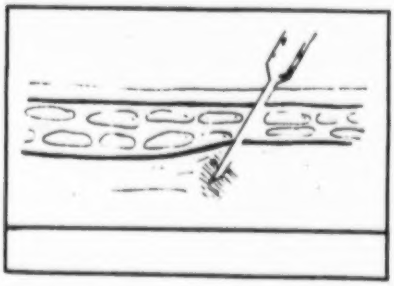


Figure 3. The **intramuscular** route is used for drugs that can irritate the subcutaneous tissue. The IM injection is directly into the muscle, such as in a penicillin shot.

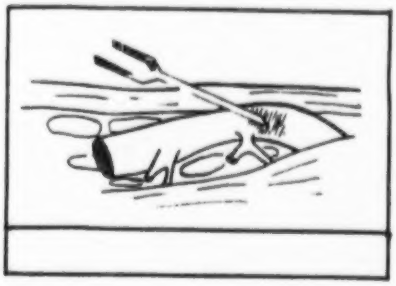


Figure 4. The **intravenous** route is the parenteral route that involves drugs being injected directly into the blood stream. The IV route provides the most rapid absorption.

Why is it in the patient's or resident's best interest to have licensed personnel administer medications by these routes?

Worksheet: Unit 2

Directions: For each of these questions, choose the one response that best completes each statement.

1. Extracts are
   A. crude drugs ground into a very fine powder.
   B. drugs contained within a gelatin cylinder.
   C. concentrated preparations of drugs obtained for example by dissolving a plant substance in alcohol or water and then evaporating the fluid.
   D. substances with a "bad taste" that have to be masked by adding a flavored solution to them.

2. A tablet is
   A. the same as a troche
   B. a drug shaped into a small sphere
   C. gelatin container
   D. a powder form of a drug compressed into a small disc

3. "Suspensions" should
   A. never be shaken
   B. always be shaken
   C. be rotated gently, e.g. between the palms of the hands
   D. be heated to body temperature before administering

4. One of the reasons that some tablets are "enteric coated" is to
   A. prevent the complete action of the drug at one time
   B. prevent the stomach from "regurgitating" the tablet upwards, e.g. as vomit
   C. prevent an irritating drug from upsetting the stomach
   D. gain a timed-release (sustained) effect

5. In medication administration, the substances that produce the drug effects are called the
   A. extracts
   B. active ingredients
   C. preparations
   D. solutions or suspensions

6. A liniment is usually administered by
   A. parenteral route
   B. aerosolzation
   C. patting it on to the skin
   D. rubbing it on to the skin

7. When capsules are taken by the oral route, one can expect **maximum** absorption in the
   A. mouth
   B. stomach
   C. small intestine
   D. rectum

8. Another name for a timed-release capsule is a
   A. spansule
   B. troche
   C. suppository
   D. emulsion

9. If a drug is not excreted (eliminated) by the body faster or equal to its being taken in by the body, one can expect a/an
   A. side effect
   B. local effect
   C. cumulative effect
   D. effect of "tolerance"

10. Situation: a 64-year old man has an attack of "angina." He has nitroglycerin tablets for this condition. In most cases, the nitroglycerine will be taken by which route of administration?
   A. oral—swallowing
   B. sublingual
   C. intravenous injection
   D. buccal

Key

1. C
2. D
3. B
4. C
5. B
6. D
7. C
8. A
9. C
10. B

Unit III
Medical Abbreviations and Symbols

NOTE: In some cases, these abbreviations are capitalized, e.g., A.M., B.I.D.

Key Abbreviations & Symbols

ABBREVIATION	ENGLISH MEANING
ā	Before
a.c.	Before Meals
ad lib.	Freely as Desired
a.m.	Before Noon
aq.	Water (e.g. as, dilute in water)
ASA	Aspirin
b.i.d.	Twice a Day (in 24 Hours, e.g. 10 A.M. & 4 P.M.)
buc.	Buccal Route
c̄ or c	With
cap or caps.	Capsule
c.c. (ml.)	Cubic Centimeter
c/o	Complains of
d.	Day
dil.	Dilute or Dissolve
dr.	Dram
elix.	Elixir
ext.	Extract
F	Fahrenheit
fld. ext.	Fluid Extract
gm. or Gm. or g.	Gram
gr.	Grain
gtt. or gtts.	Drops
h.	Hour
h.s. (H.S.)	Hour of Sleep (at bedtime)
hypo.	Hypodermic route
l.	Liter
lot.	Lotion
♏	Minim
mg.	Milligram
ml. (c.c.)	Milliliter
MR	May Repeat
noct., noc., or n.	In the Night
non rep.	Do Not Repeat
n.p.o.	Nothing by Mouth

ABBREVIATION	**ENGLISH MEANING**
(o)	Oral Route
O D	Right Eye
oint., ung.	Ointment (unguent)
Ophth	Ophthalmic
O S	Left Eye
O U	Both Eyes
oz.	Ounce
p.c.	After Meals, e.g. ½ hour after a meal
per	By
p.m.	Afternoon
p.o.	By Mouth (per os)
p.r.n.*	As Circumstances may Require; as needed
q. or qq.	Every
q.d.	Daily; every day
q.h.	Every Hour
q. 2h	Every two hours (any numeral may be used)
q.i.d.	Four times in 24 hours, e.g. 8 AM, Noon, 4 PM, 8 PM.
q.o.d.	Every Other Day
(R)	Rectal Route
®	(registered) trade name
Rx	Take
rep.	Let it be repeated
$\bar{s}$ or s	Without
$\overset{\cdot\cdot}{\overline{ss}}$	One-half (½)
S., or Sig.	Write: (Ex: directions placed on the label of the medication)
sol.	Solution
S.O.S.	If Necessary
sp.	Spirit
Stat.	Immediately
Subl. or SL., or Subling.	Sublingual
Supp.	Suppository
syr.	Syrup
tab.	Tablet
tbsp.	Tablespoon

---

*You must understand the difference between s.o.s. and p.r.n. Note that s.o.s. means **IF** necessary but one dose only. More than one dose should not be given. Note that p.r.n. means when required or as often as needed. P.R.N. is more commonly used.

ABBREVIATION	ENGLISH MEANING
t.i.d.	Three Times in 24 Hours
tr. or tinc.	Tincture
tsp.	Teaspoon
u.	Unit
μ	Micron
ung. or oint.	Ointment
w/	With
w/o	Without

Note: 37°C = 98.6°F (Body Temperature)

Be Careful

μ = micro = one-millionth of
m = mill = one-thousandth of

Do Not Confuse

mcg = microgram (1/1,000,000 gram); also written as μgm
meq - one thousandth of an equivalent of a chemical element, radical, or compound; - a variable measure (milliequivalent)
mg - milligram (1/1,000 gram)
ml - milliliter
mm - millimeter

Conversion of Roman Numerals to Arabic Numerals (1-20)

i or I = 1
ii or II = 2
iii or III = 3
iv or IV = 4
v or V = 5
vi or VI = 6
vii or VII = 7
viii or VIII = 8
ix or IX = 9
x or X = 10
xi or XI = 11
xii or XII = 12
xiii or XIII = 13
xiv or XIV = 14
xv or XV = 15
xvi or XVI = 16
xvii or XVII = 17
xviii or XVIII = 18
xix or XIX = 19
xx or XX = 20

Common Chemical Abbreviations and Symbols

ABBREVIATIONS	MEANING
@	At
ASA	Aspirin
ETOH	Alcohol
HCl	Hydrochloric Acid
H_2O	Water
KCl	Potassium Chloride
KI	Potassium Iodide

ABBREVIATION	MEANING
Na	Sodium
NaCl	Sodium Chloride (Table Salt)
pH	A measurement of acidity or Alkalinity. pH 7 = neutrality
®	(registered) trade name
Rx	Take
SYMBOLS	**MEANING**
ʒ	Dram
℥	ounce

(Your instructor will discuss other short-hand systems which look like this: $\dot{\overline{\text{i}}}$, $\ddot{\overline{\text{ii}}}$, $\dddot{\overline{\text{iii}}}$ etc.).

Examples

℥ $\ddot{\overline{\text{ss}}}$ ½ ounce

℥ $\dot{\overline{\text{i}}}$ 1 ounce

℥ $\overline{\dot{\text{i}}\ddot{\text{ss}}}$ 1½ ounces

ʒ $\overline{\dot{\text{i}}\ddot{\text{ss}}}$—one & one-half drams
℥ $\dot{\overline{\text{i}}}$—one ounce
℥ $\ddot{\overline{\text{ss}}}$ - one-half ounce

Abbreviations Used in Administering Medications by the Parenteral Route

ID—intradermal
Sub-Q or SQ—subcutaneous
IM—Intramuscular
IV—Intravenous

Medication Orders

Introduction

When a doctor requests that a nurse or another health care worker administer a drug or drugs to a patient, that doctor is giving a medication order. A medication order may be expressed in writing, or verbally. The doctor will also use terms, abbreviations and numbers, that if not understood, could have dire consequences if misinterpreted or written incorrectly.

The understanding and accurate use of medical abbreviations is essential. Medical abbreviations are a brief, short-hand way of communicating among professionals. The commonly used standard abbreviations seen in this unit must be memorized. They will be used extensively in the recording procedure on the medication record, nurses' notes, and other legal documents. They also are crucial in reading and understanding doctors' orders, and data recorded by other personnel.

The Medication Order

Written orders from physicians or dentists are usually written in a special place for doctors' orders, on a patient's chart. (See next page).

In contrast, a prescription "blank" is used to write medication orders for persons (outpatients) who need to obtain drugs from a pharmacy. (See p. 57).

Orders may be given verbally, in an emergency, when there is not time to write them down; or, verbal orders may be given over the phone when the doctor is away from the facility. In each case, the verbal order is written down, and then signed by the doctor as quickly as possible.

The person who is allowed to take down verbal orders differs according to each state, each kind of facility, and each facility's own policies. One must ask about policies regarding the receiving and writing of medications/orders, particularly those for prescription drugs.

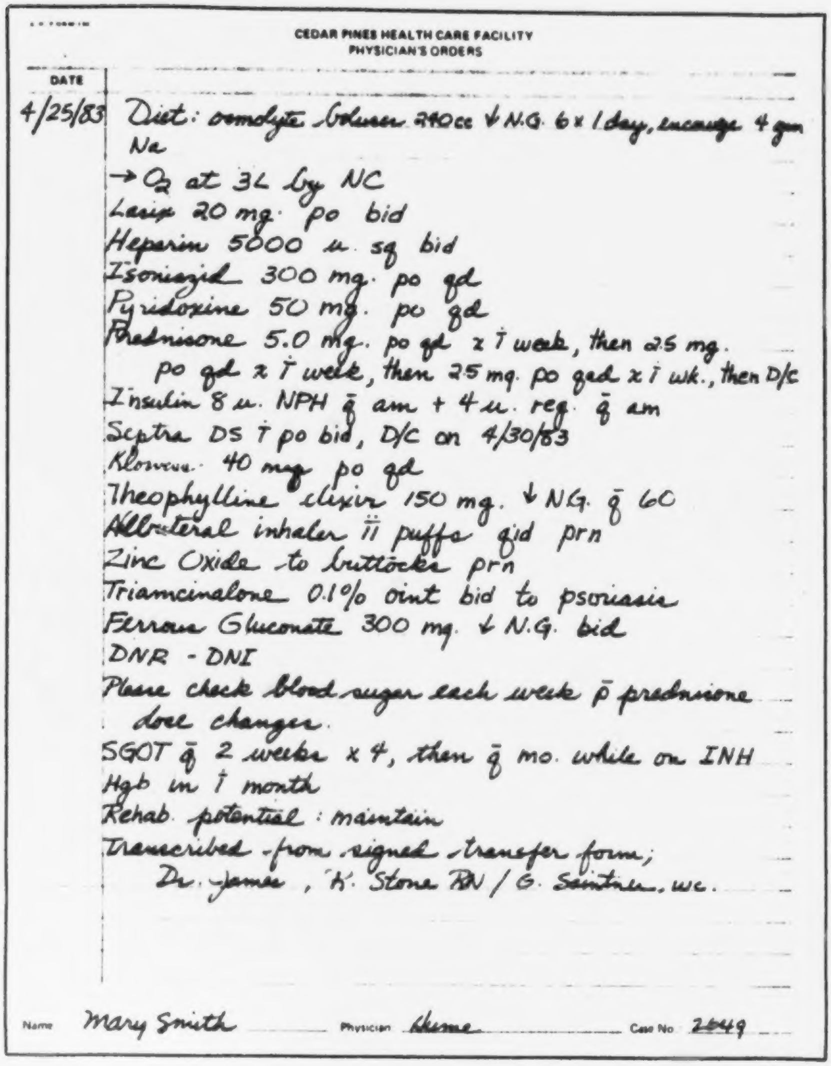
The medication order includes a number of important pieces of information. All must be understood, so that the medication can be prepared accurately and administered correctly. The basic parts of a medication order include the following:

1. The patient's (resident's) full name

For proper identification, the last and first name (as well as middle initial) are needed. The patient's identification number should be included as well. The patient's age may be listed, especially if the dosage needs to be checked, e.g., for elderly persons.

2. Date of the order

The day, month, and year are included. (Often, the time of day when the order was written is shown, which helps avoid confusion when there is a staff shift change. The 24-hour clock may be used to avoid confusion, e.g. 10 A.M. may be written as 1000 hours; 6:30 P.M. as 1830 hours).



CEDAR PINES HEALTH CARE FACILITY
PHYSICIAN'S ORDERS

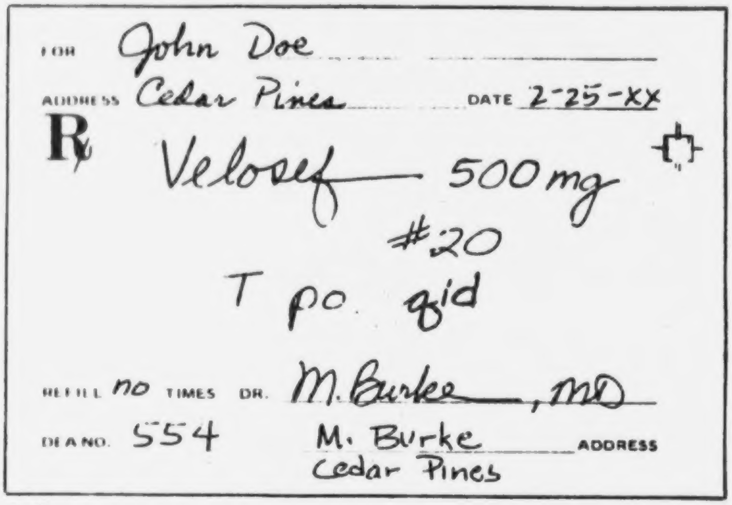
DATE

4/25/83 Diet: osmolyte Boluses 240cc ↓ N.G. 6 x 1 day, encourage 4 gm Na
→ O_2 at 3L by NC
Lasix 20 mg. po bid
Heparin 5000 u. sq bid
Isoniazid 300 mg. po qd
Pyridoxine 50 mg. po qd
Prednisone 5.0 mg. po qd x ī week, then 2.5 mg.
po qd x ī week, then 2.5 mg. po qod x ī wk., then D/c
Insulin 8 u. NPH $\bar{q}$ am + 4 u. reg. $\bar{q}$ am
Septra DS ī po bid, D/c on 4/30/83
Klonerus 40 mg po qd
Theophylline elixir 150 mg. ↓ N.G. $\bar{q}$ 6°
Albuterol inhaler īī puffs qid prn
Zinc Oxide to buttocks prn
Triamcinalone 0.1% oint bid to psoriasis
Ferrous Gluconate 300 mg. ↓ N.G. bid
DNR - DNI
Please check blood sugar each week $\bar{p}$ prednisone dose changes.
SGOT $\bar{q}$ 2 weeks x 4, then $\bar{q}$ mo. while on INH
Hgb in ī month
Rehab. potential : maintain
Transcribed from signed transfer form;
Dr. James , K. Stone RN / G. Saintree, wc.

Name Mary Smith Physician Hume Case No 2649

3. Name of the medication

On a prescription blank, this is preceded by the sign "Rx", which means "take". Then, the drug's generic name or trade name is written out.



FOR John Doe

ADDRESS Cedar Pines DATE 2-25-XX

℞ Velosef 500 mg

#20

T po qid

REFILL no TIMES DR. M. Burke, MD

DEA NO. 554 M. Burke ADDRESS

Cedar Pines

4. Dosage

The dosage includes the amount of the drug and the strength of the preparation. (For example a total of (30)—10 mgm tablets.) It also includes when and how the drug is to be taken, e.g., q.i.d., with meals. The dosage part of the order should also tell whether it is an automatic stop order, or a standing order.

a. An **automatic stop order** stops at a certain time or after a certain number of doses.

b. A **standing order** can be continued.

5. Route of administration

Route of administration may be included, e.g. sublingual. If not, one may usually assume that the medication is to be taken orally.

6. Physician's (dentist's) signature

The signature of the doctor requesting the medication is essential and required to make it legal. When an order is taken by phone, the physician must cosign it as quickly as possible.

When a doctor prescribes medications for outpatients, the prescription blank will also include

7. Number or refills

Some drugs, e.g., those of Schedule II, may not be refilled without another prescription. For other drugs, the order may show a certain number of refills. The Latin word, "**repetatur**" (meaning repeat) may be included with the numbers 0-1-2-3 such that the doctor may choose from the number of refills.

8. Labeling instructions

The labeling instructions will tell a pharmacist what instructions to put on the medication container, e.g. "Take two tablets at bedtime."

9. Doctor's DEA number

The doctor's registration number with the DEA may be included; it is required on all prescriptions for controlled substances. Therefore, a medication order requires knowledge not only of the legalities of verbal and written order, but also of what the order means.

Medical Abbreviations

Introduction

The abbreviations, symbols, and conversions of Roman numerals to arabic numbers must be memorized and understood. For example, the following order may be received from a physician for a resident:

Mellaril, 10 mg, p.o. B.I.D.

The TMA should know, then, that 10 mg of the drug Mellaril is to be taken orally by the patient, twice in a day (in a 24 hour period).

Abbreviations and symbols can be grouped by several methods:

1. **forms** of medications, e.g. capsules, suppositories
2. **routes** of administration. e.g. oral, rectal
3. **times** of administration, e.g. before meals, every 4 hours
4. **general medical abbreviations**, e.g. n.p.o. - nothing by mouth, c/o - complains of.
5. **symbols**, e.g. KCl - potassium chloride, or Rx - take
6. Conversion of Roman to Arabic **numbers**

These groupings follow:

1. **Forms** of medications

ABBREVIATION	**FORM**
cap. caps.	capsule
elix.	elixir
ext.	extract
fld. ext.	fluidextract
lot.	lotion
oint., ung.	ointment (unguent)
sol	solution
sp.	spirit
supp.	suppository
syr.	syrup
tab.	tablet
tinct., tr.	tincture

2. **Routes** of Medication Administration

ABBREVIATION	**ROUTE**	**MEANING**
buc	buccal	inside the cheek
hypo, h, H	hypodermic	beneath the skin
ID	intradermal	into the skin
IM	intramuscular	into the muscle
IV	intravenous	into the vein
p.o., O., "o"	oral	by mouth
p.r., r, "R."	rectal	by rectum
sub-Q, SQ	subcutaneous	just under the skin (into the fatty layer)
subling, subl	sublingual	beneath the tongue

3. **Times** of Medication Administration

ABBREVIATION	**MEANING**	**COMMON TIMES GIVEN***
a.c.	before meals	½ hour before a meal
ad lib.	at one's pleasures	freely as desired
A.M., AM, A, a.m.	before noon	morning
b.i.d.	twice a day	10 a.m. and 4 p.m.
h.	hourly	on each hour
h.s.	hour of sleep	at bedtime
n., noc.	night	in the night
p.c.	after meals	½ hour after a meal
P.M., PM, P, p.m.	after noon	afternoon
p.r.n.	according to circumstances; occasionally	repeat when necessary
q.d., qq.d.	every day	10 a.m. or as ordered
q.h., qq.h.	every hour	on the hour
q.2h.	every two hours	6 a.m. & on even hours
q.4h	every four hours	8, 12, 4, 8 (day & night)
q.i.d.	four times a day	8 a.m., 12 noon, 4 p.m., 8 p.m.
q.o.d.	every other day	10 a.m. every other day, or as ordered
s.o.s.	if necessary	one dose given, only if the patient seems to need it.
stat	immediately	given immediately as ordered
t.i.d.	three times a day	(usually given with meals)

---

*Medication schedules vary with different health facilities; therefore, the specific times may vary according to where one works.

4. **General Medical Abbreviations**

ABBREVIATION	**MEANING**
$\bar{a}$	before
A.S.A.	acetylsalicylic acid (aspirin)
$\bar{c}$	with
cath.	catheter
c/o	complains of
dil.	dilute
n.p.o.	nothing by mouth
non rep.	do not repeat
OD	right eye
OS	left eye
OU	both eyes
per	by
p.o.	by mouth
q., qq.	every
s	without
sig.	write on label
ss	one-half

5. Common Medical **Symbols**

@	at, at the rate of
°C	degrees Celsius (Centigrade)
ETOH	Alcohol
°F	degrees Fahrenheit
HCl	hydrochloric acid
H_2O	water
KCl	potassium chloride
KI	potassium iodide
NaCl	sodium chloride (table salt)
pH	acid/alkali balance (on a scale from 0 to 14) 7 = neutrality. 1 = acid. 14 = base.
Rx	take (Latin: recipe)
®	(registered) trade name

6. In addition, Roman numerals, rather than Arabic numbers may be used. In this case, one should be able to convert Roman numerals (upper and lower case) to Arabic numbers, as seen below:

i or I - 1
ii or II - 2
iii or III - 3
iv or IV - 4
v or V - 5
vi or VI - 6
vii or VII - 7
viii or VIII -8
ix or IX - 9
x or X - 10

xi or XI - 11
xii or XII - 12
xiii or XIII - 13
xiv or XIV - 14
xv or XV - 15
xvi or XVI - 16
xvii or XVII - 17
xviii or XVIII - 18
xix or XIX - 19
xx or XX - 20

Worksheets

Worksheet #1

Directions: For each order, from medication cards listed below, translate each of the indicated abbreviations, and write the translation in the space provided.

1. NEMBUTAL 100 mg. (o) h.s. prn. For sleep
mg. ________
h.s. ________
prn. ________

MINOCIN 100 mg. (o) q12h for 14 days
q12h ________

3.KI gtts. X q.d. WITH A FULL GLASS OF WATER
KI________
gtts. ________
X ________
q.d. ________

4. ASA gr. 5 (o) prn. q4h For pain or discomfort
ASA________
gr. ________
(o) ________

Directions: In the proper space, give the abbreviations for each of the following:

1. Immediately ________
2. Freely as Desired ________
3. Every Other Day ________
4. Nothing by Mouth ________
5. Hour of sleep (at bedtime) ________
6. As needed ________

Worksheet #2

Directions: Using the format illustrated below, translate each medication order identified under problems 1–5.

Example: The order reads:
"A.S.A. comp. gr. X, bid, (o)".

Problem:
#1: "Meperidine tab. 50 mg. prn, q 4h, PO."
#2: "Elix. Benadryl ʒ ïï, hs, (o)."
#3: "Compazine syrup, ï, tid, (o)."
#4: "Phenobarbital, 30 mgm, p.o. B.I.D."
#5: "Isordil, 10 mgm, p.o. q.i.d."

Format for translating Drug Orders

	drug name	drug form	dose	time	route
Example:	ASA	comp (ound)	ten grains	twice in 24 hours	oral
Problem: #1					
#2					
#3					
#4		X			
#5		X			

Worksheet #3

For each of the following two orders, from medication cards listed below, translate each of the indicated abbreviations and write the translation in the space provided.

1. DILANTIN, 100 mg, p.o. T.I.D.

mg. ____________________

p.o. ____________________

T.I.D. ____________________

2. HALDOL, (1) mg. p.o. B.I.D.

p.o. ____________________

B.I.D. ____________________

Multiple Choice. For each of the following questions, select the one best answer.

3. A patient has a prescription for Sinequan, 75 mg. p.o. H.S. In this case, H.S. means

A. as needed

B. as a suppository

C. three times in 24 hours

D. prior to going to sleep

4. An order is received for Lasix, 40 mg every A.M. In this case, A.M. means

A. before meals

B. before noon

C. freely as desired

D. after a meal

5. The following notation is made on a patient chart: "c/o dizziness upon waking." The abbreviation c/o means

A. without

B. capable of having

C. complains of

D. with

6. A patient is receivng K-LYTE, 25 meq in water p.o. B.I.D. Here, the abbreviation meq indicates

A. milligrams

B. milliequivalents

C. micrograms

D. "dissolved in"

Worksheet #4

Directions: Translate each of the medical abbreviations and indicate the proper translation of each in the space provided. You must score at least 27 correct to pass.

Flagyl, 25 m.g., (o), tab ṫ, t.i.d., X 10 d; for relief of urinary infection

1. m.g.________________
2. (o) ________________
3. tab ṫ________________
4. t.i.d. ________________
5. X 10d ________________

Travase ung. to wound area
Thin layer. Apply t.i.d.
Cleanse area with ℥ïï NaCl solution before applying ung.

6. ℥ïï ________________
7. NaCl ________________
8. ung.________________

Optochlor ophth solution,
0.5% ïï gtts. os, q.3h

9. ophth ________________
10. ïï gtts ________________
11. os ________________
12. q.3h ________________

K-Lyte DS; dissolve ṫ tab. in 200 c.c. of H_20. Administer a.c., or c̄ meals; allow to sip slowly for V - X minutes

13. 200 c.c.________________
14. H_20 ________________
15. a.c. ________________
16. c̄ ________________
17. V - X ________________

Zentron, Liquid ṫ or ïï tsp, q.i.d. X 10d

18. tsp________________
19. q.i.d.________________

Lotrimin cream 1%, massage into affected area on right buttock, a.m. and h.s.

20. a.m. ________________
21. h.s. ________________

Amytal sodium, I.M.(ṫ gm in 4 m l.), into left gluteal area.

22. I.M. ________________
23. ṫ gm ________________
24. 4 m l.________________

Nitroglycerin gr. 1/100 Stat. and P.R.N. For relief of chest pain.

25. gr. 1/100 ________________
26. Stat. ________________
27. P.R.N. ________________

1% Isopto-Carpine gtts, ïï ophth., O.D., b.i.d. (a.m. and NOC).

28. O.D. ________________
29. b.i.d. ________________
30. NOC________________

Worksheet #5

Directions: Translate each of the abbreviations and indicate the proper translation of each in the space provided. You must score at least 27 correct to pass.

ASA gr X (o) q4h p.r.n.

1. ASA ____________
2. gr. ____________
3. X ____________
4. q4h ____________
5. p.r.n. ____________

Isoptocarpine 1% gtts ī O.D. q.i.d.

6. gtts ____________
7. O.D. ____________
8. q.i.d. ____________

Zinc Oxide ung. to left lower extremity t.i.d.

9. ung. ____________
10. t.i.d. ____________

Clear Liquids p.o. ad lib

11. p.o. ____________
12. ad lib ____________

Milk of Magnesia ℥ ī (o) h.s. q.o.d.

13. ℥ ī ____________
14. h.s. ____________
15. q.o.d. ____________

Doxepin HCl 25 mg. (o) t.i.d.

16. HCl ____________
17. mg. ____________

Chlorpromazine 25 mg. supp. (R) q.d. if restless

18. supp. ____________
19. (R) ____________
20. q.d. ____________

Robitussin tsp ī (o) q.6.h. p.r.n.

21. tsp. ____________
22. q.6.h. ____________

Orinase 0.5 gm. (o) stat.

23. gm. ____________
24. stat. ____________

Pen-Vee K 400,000u. (o) q.6.h.

25. u. ____________

Theragran tab ī (o) q.a.m. p.c.

26. tabl ____________
27. q.a.m. ____________
28. p.c. ____________

Gelusil ℥ s̄s̄ (o) 1 hr. a.c.

29. ℥ s̄s̄ ____________
30. a.c. ____________

Unit IV Key Words

How much of a drug is given, and the route(s) by which it is given.	**Administration**
A dangerous or unexpected (unusual) effect of a drug.	**Adverse reaction**
The licensed drug name under which a drug is prepared by a specific manufacturer and sold. The brand name is often represented by a capital R that is circled. ® .	**Brand (trade) name**
The drug name given by a chemist; it describes the drug's chemical structure.	**Chemical name**
What a drug is made of.	**Composition**
A condition under which a drug should **not** be used. (Also, a condition or disease that makes an indicated medication, or treatment, inadvisable).	**Contraindication**
The name given to a new drug by the manufacturer, subject to approval by the American Medical Association (AMA) and World Health Organization (WHO). Like generic foods, a generic drug tends to be more inexpensive than that listed under a trade name.	**Generic name**
Why a drug is used; its purpose for use.	**Indication**
The drug name printed in the United States Pharmacopeia/National Formulary (USP/NF).	**Official name**
Physicians Desk Reference—A widely used drug reference published by Medical Economics Co. The PDR is divided into seven sections: Manufacturer's Index (white); Product Name Index (pink); Product Classification Index (blue); Generic and Chemical Name Index (yellow); Product ID section (glossy white); Product Information (white); Diagnostic Product Information (green).	**PDR**
Care or caution taken in advance (warning).	**Precaution**
Natural, expected, unavoidable effects that accompany the intended effect(s) of a drug.	**Side-effects**
United States Pharmacopeia/Dispensing Information. An official drug reference published annually by the U.S. Pharmacopeia Convention (Rockville, MD) that contains information for pharmacists or persons administering medications.	**USPDI (USP/DI)**
"Red light" conditions that alert a health care worker to possible complications, interactions or situations which may need further attention. These are special considerations that may alter a drug's effects and that should be considered when prescribing the drug.	**Warnings (Precautions or Special Considerations)**

Unit IV
Use of Medication References

Introduction

In this unit you will begin to use what you have already learned in a problem-solving approach to obtaining information concerning medications. Every person who administers medicines is obligated to know each drug's intended use, its classification, side-effects, adverse reactions, warnings and special considerations. In addition, dosage and the route of administration must be known.

In studying this unit, be sure to have a current drug reference available—one no more than two years old. The two references emphasized in this unit are the PDR and the USPDI. In addition, a medical dictionary would be helpful.

The PDR & USP/DI

There are several reference books available that provide useful information about drugs. Drug references help one understand why and how a particular drug is administered. For each drug, a reference usually includes information about:

composition—what the drug is made of.

indications—why the drug is used (purpose for use).

contraindications—conditions under which the drug should not be used, or should be used with extreme caution.

precautions—special conditions that may alter the drug effects and that should be considered when prescribing the drug.

side effects—natural, expected and unavoidable effects that accompany the intended effect(s) of a drug.

adverse reactions—dangerous or unusual effects of a drug.

administration—how much of the drug to give; routes given.

how supplied—forms available.

The most popular reference book is the PHYSICIAN'S DESK REFERENCE (PDR), which is available in most health facilities. The PDR gives information about the drug products of major pharmaceutical companies. It is useful for checking dosages, routes of administration, and side effects. It lists drugs by their trade names, generic names, uses, and manufacturers. Color photographs are included in a "Product Identification" section to help identify common drugs.

A new drug reference is the UNITED STATES PHARMACOPEIA/DISPENSING INFORMATION, or the USP/DI. The USP/DI is written in more readable language. It provides the pharmacist and health care provider with easy-to-follow information about all the official drugs available. It is particularly useful in explaining the use of a drug to a patient. The text is revised every year to update information on new and old drugs.

Other valuable references are the HANDBOOK OF NONPRESCRIPTION DRUGS, published by the American Pharmaceutical Association, or the HOSPITAL FORMULARY.

The Naming of Drugs

The current use of many names for the same drug is confusing for all health professionals. As the chart below indicates, a given drug may be known by any of several names. Each name has a specific significance to certain persons.

Name	**Example**
generic (a classification)	sympathomimetic amines
chemical	alphamethylphenethylamine
Family or Category (Monograph by USPDI)	amphetamine
Trade (brand)	Dexedrine®, Benzedrine®
street (slang)	speed, dex, white crosses, Bennies, crystal

To review, each drug has an **official** name under which it is listed in one of the official publications, such as in the United States Pharmacopeia/National Formulary (USP/NF). Before a new drug becomes official, it will be assigned a **generic** name. As one can observe from the above chart, the generic name is more simple than the chemical name, although it may reflect the chemical family to which the drug belongs. The generic name is never changed, can be used in all countries, and is not protected by law. **Family** or **category** places related drugs under a grouping such as antacid or analgesic.

The **chemical** name is useful principally to a chemist; it is a very precise description of the drug's chemical structure. The **trademark** or **trade** or **brand** name usually appears in the literature with an ® at the upper right of the name. This notation indicates that the name is protected by law and cannot be used by anyone but the manufacturer who is the legal and licensed owner of the name. The trade name is capitalized, while the generic name is not. Often, the generic name is written and is then followed by trade name in parenthesis.

The **street** name varies with the time and geographic location. As with all other slang, it provides a jargon to be used by select "inner" groups.

As a final example of these kinds of names, Valium® is the brand name (of the Roche Company) for the drug diazepam. Diazepam is both the official and generic name for this drug. Its chemical name is 7-chloro-1, 3-dihydro-1-methyl-5-phenyl-2H-1,4 benzodiazepin-2-one.

The trend over the past few years has been for drugs to be prescribed using the generic name. Such generic prescribing is expected to increase since generic drugs tend to be cheaper.

The PDR

a. **How is the PDR organized?**

The PDR contains data on over 2500 drugs; thus, some organization of the PDR is necessary. The sections of the PDR are as follows:

Section I MANUFACTURER'S INDEX (white)—Addresses, emergency phone numbers and a partial listing of available products are provided.

Section II PRODUCT NAME INDEX (pink)—Products are listed alphabetically by "trade" or brand names. Page numbers indicate colored pictures and data.

Section III PRODUCT CLASSIFICATION (blue)—Products are listed based on pharmacologic action or drug family.

Section IV GENERIC AND CHEMICAL NAME INDEX (yellow)—Generic and chemical names are indicated alphabetically according to chief ingredient(s).

Section V PRODUCT IDENTIFICATION SECTION (colored plates)—By company name, products are shown in their actual sizes, shapes and colors.

Section VI PRODUCT INFORMATION SECTION (white)—Alphabetical listing, first by company and then by trade name of some 2500 products.

Section VII DIAGNOSTIC PRODUCT INFORMATION (green)—This is for use by the doctor in diagnosing.

Poison Control Centers

In addition, supplements are periodically issued by the publisher to update information. These should be fastened inside the front cover.

b. For each drug listed, the PDR follows this general outline in the Product Information Section:

- Name (brand)
- Pharmaceutical company that produces it
- Description
- Action
- Indications
- Contraindications, including warnings
- Adverse reactions
- Dosage & Administration (Adults/Children)
- Overdosage
- How supplied

The USPDI

A. How is the USPDI organized? First it is grouped by alphabet, under "family" headings, such as Acetaminophen, Adrenocorticoids, Albuterol...Then, its effect, e.g., "systemic" is noted. For each "family . heading" of medication, the USPDI's organization follows this general format:

Category
  Indications

Pharmacology
  Mechanism of action
  Absorption
  Distribution
  Protein binding
  Metabolism
  Half-life
  Onset of action
  Time to peak concentration
  Peak serum concentration
  Time to peak effect
  Duration of action
  Excretion
    In dialysis

Precautions to Consider
  Cross-sensitivity
  Pregnancy
  Breast-feeding
  Pediatrics
  Geriatrics
  Drug interactions and/or related problems
  Diagnostic interference
    With diagnostic test results
    With physiology
  Medical problems
  Patient check-ups

Side/Adverse Effects
  Those indicating need for medical attention
  Signs of overdose
  Those indicating need for medical attention only if they continue or are bothersome.

Patient Consultation
  Before using this medication
  Proper use of this medication
  Precautions while using this medication
  Side/adverse effects

General Dosing Information

Dosage forms (each separate)
- Usual adult dose
- Usual adult prescribing limits
- Usual pediatric dose
- Strengths usually available
- Packaging and storage
- Stability
- Label
- Note to the dispenser
- Additional information

Selected brand names are included in the monographs and index for purposes of reference. However, the USPDI groups by family headings so as to *not* endorse a specific product.

A comparison of the main headings of the PDR and USPDI is found in Figure 4-1.

Figure 4-1
Comparison of the PDR and USPDI: Main Headings Used

PDR	USPDI
Name/Manufacturer	Category —Indications
Description	Pharmacology
Action	Precautions to Consider
Indications	Side/Adverse Effects
Contraindications	Patient Consultation
Adverse Reactions	General Dosing Information
Dosage and Administration	Dosage Forms
Overdosage	
How Supplied	

Neither the PDR or USPDI should be memorized—rather how either can be used should be known. There are two hallmarks to administering medications:
- **never** administer a medication with which you are not familiar.
- when in doubt, look it up!

Using the PDR or USP/DI

You will need to correctly look up the PDR or USPDI five topics on five medications. Feel free to bring to class the names of five medications used commonly in your facility. A chart is provided in this text for the purpose of recording these data.

An instructor will give your considerable practice in using drug references: right now, let us "walk through" an example.

Example: Using the PDR or USPDI

A resident, Mr. Nick O'Calovan is diagnosed as suffering from pulmonary emphysema. His physician has prescribed "Isuprel Elix., 30 ml qid prn for breathing difficulty." After Mr. O'Calovan has been on this regimen for a short time, it is observed that he is becoming increasingly nervous and agitated; the TMA wonders if this should be brought to the attention of the nurse. Consulting the **PDR** or **USPDI** will assist in knowing whether this is an expected, adverse, or idiosyncratic reaction and will guide one in making more intelligent observations and in knowing what to report to licensed personnel.

Look up Isuprel in an available drug reference:
1. Is Isuprel a trade or a generic name?
—Answer: Trade name: it is capitalized. (In the USPDI it is listed under Isoproternol).

2. What section of the PDR lists trade names?
—Answer: Since the brand name and trade name are synonymous, it is listed in the pink section, "Product Name Index."

3. Which pages describe Isuprel in detail?
—Answer: In the PDR, these pages are obtained from the pink section and indicate certain pages in the white section, "Product Information." In the USPDI, they are listed under Isoproterenol.

4. Now that Isuprel is described, what other information is needed? In this example, one is trying to determine if nervousness and agitation are the
 a) reason for using the drug,
 b) whether an expected side-effect,
 c) whether an adverse reaction or
 d) whether a reaction specific to the resident himself, i.e, an idiosyncratic reaction.

5. What do the terms 'indications', 'contraindications', 'warnings', 'adverse reactions' and 'precautions' mean? To answer, we turn to the exercise worksheet in this unit.

A New Vocabulary

Look at the exercise worksheet in this unit. The extreme left column indicates the Drug Category (Drug Classification) of the medication to be studied. See Figure 4-2. All other drugs in the same category are used for the same general purpose. The Drug Classification Index (light blue in the PDR) is somewhat difficult to use. For the present, leave this column blank on the worksheet.

The second column, Usual Use, is the drug's intended purpose, e.g. as a laxative, or as an antianxiety medication. This column refers to various conditions which *may* be present in the patient/resident for whom the physician prescribes a drug. Very few patients have all the medical problems listed in the PDR or USPDI (or drug classification sheets), as reasons for using the drug. The column, Usual Use, is also known as purpose for use, or "indications." In contrast, contraindications refers to predisposing conditions that would caution a physician from prescribing a drug, even though the patient would otherwise qualify under "indications." Contraindications warn the physician that the conditions listed are not compatible with the associated medication.

Figure 4-2
Major Categories of Medications

	Major Categories of Medications
A pain-relieving remedy (e.g., Darvon, aspirin, Tylenol, Demerol).	**1. Analgesic**
An agent that reduces or eliminates acids in the stomach (e.g., Maalox, MOM)	**2. Antacid**
A substance that treats anxiety, (e.g., Valium)	**3. Antianxiety**
A substance that kills or slows the growth of bacteria, (e.g., ampicillin, cephalexin, erythromycin, tetracycline, sulamethoxazole). Ophthalmic antibacterial includes Gantrisin.	**4. Antibacterial**
An agent which slows blood clotting (e.g., Coumadin)	**5. Anticoagulant**
A substance that prevents or stops seizures (e.g., Dilantin, phenobarbital, carbamezepine).	**6. Anticonvulsant**
A medication used to treat depression (e.g. Elavil)	**7. Antidepressant**
A drug used to treat and control mild and uncomplicated diabetes (e.g. Orinase)	**8. Antidiabetic Agent**
A "drying" agent used to treat allergic symptoms (e.g. Benadryl)	**9.Antihistamine**
A drug used to treat Parkinson disease that may or may not be caused by other drugs (e.g. L-dopa, Sinemet)	**10. Antiparkinsonism Agent**
A medication used to treat psychosis and to control behavior (e.g., Mellaril, Thorazine, Haldol, Navane, Lithium Carbonate)	**11. Antipsychotic and Antimanic Agent**
A drug used to treat various circulatory disorders such as angina, arrhythmias, tachycardia, hypertension, together with diuretics used to increase urinary output (e.g., Inderal, Lasix, nitroglycerin).	**12. Cardiovascular Agent**
A substance used to induce coughing and flow of fluid from the respiratory tract (e.g., Robitussin)	**13. Expectorant**
An agent which stimulates and loosens the bowels (e.g., Dulcolax, Metamucil, M.O.M., Colace).	**14. Laxative**
A drug used to treat scabies, head and crab lice (e.g., Kwell).	**15. Pedicalicide, Scabicide**
An agent that quiets activity or induces sleep (e.g., Dalmane)	**16. Sedative/Hypnotic**
A substance used to treat various dermatitis conditions, or skin conditions due to insect bites, poison ivy, and the like (e.g., hydrocortisone)	**17. Topical Steroid**
A drug used to treat fungal infections, most specifically, candidiasis e.g. of the vagina (e.g., Monistat)	**18. Antifungal**
An agent used to treat asthma (e.g., Intal)	**19. Antiasthmatic**
To treat asthma patients or others with bronchospasm (e.g., Ventolin, Proventil)	**20. Bronchodilator-Albuteral Inhalation**
An adjunct to the treatment of diarrhea (e.g., Lomotil)	**21. Antidiarrheal**
A drug used to treat ear infections (e.g., Neomycin, Polymyxin B, Hydrocortisone).	**22. Andrenocorticoid Otic**
Medications used to replenish electrolytes, especially potassium (e.g. KCl, or K-Lor).	**23. Potassium Supplements**

Figure 4-3

COMMON SIDE EFFECTS

Note: These are not all inclusive

Common Side Effects

COMMON SIDE EFFECTS

- Anxiety
- Black (tarry) stools
- Blurred vision
- Breast tenderness
- Bruising
- Burning sensation
- Chest pains
- Cloudy urine
- Clumsiness
- Confusion
- Constipation
- Cramps
- Depression
- Dermatitis
- Diarrhea
- Dizziness
- Drowsiness
- Dryness of mouth, nose, skin
- Edema
- Fainting
- Fatigue
- Fast heartbeat
- Fever
- Flushing
- Headache
- Heartburn
- Hiccups
- Hives
- Impotence
- Insomnia
- Irritability
- Itching
- Lightheadedness
- Low blood pressure
- Menstrual irregularity
- Mood change
- Nasal stuffiness
- Nausea
- Nervousness
- Numbness or tingling of fingers/toes
- Palpitations
- Rapid pulse
- Rash
- Ringing in the ears
- Restlessness
- Sensitivity to sunlight
- Slurred speech
- Shortness of breath
- Sore throat
- Stomach pain
- Sweating
- Swelling of legs/ankles
- Thirst
- Tingling
- Tiredness
- Tremors
- Twitching
- Uncontrolled body movements
- Unusual bleeding
- Unsteadiness
- Urine discoloration
- Urinary discoloration
- Urinary frequency
- Urine retention
- Upset stomach
- Vaginal discharge
- Vomiting
- Weakness
- Wheezing

The third column is for Side Effects—those natural, expected and unavoidable effects of the medication that are found in addition to the desired (intended) effect. See Figure 4-3. In short, side effects often "go with the territory," and can be expected. Occasionally, a given medication's side-effects may be the purpose for using a medication (when the side effect is desired). An example of this is Benadryl. Generally, this medication is prescribed for patients who have cold-like symptoms, in order to dry out their mucous membranes. A side-effect is sleepiness. Consequently, Benadryl may be prescribed for those persons who need a mild sedative in order to sleep.

Examples from the drug category are seen in the fourth column.

The fifth column, Usual Dosage, suggests a medication regimen that guides the physician in determining a dosage schedule for the particular patient (adult and pediatric). Such dosage schedules result from extensive clinical testing; however, they may be changed as necessary, for each patient.

The various considerations regarding doses are detailed in the White Section of the **PDR**, or under General Dosing Information in the **USPDI**.

Note: Controlled substances are indicated in the **PDR** by the presence of a large 'C' with a roman numeral inside it. Example—Valium CIV indicates that Valium is a controlled substance in schedule IV.)

The sixth column, Special Considerations (also called Warnings) may be thought of as precautions. This category lists 'red light' conditions that alert the health provider to possible complications, interactions, or situations that may need further attention. They also include situations in which the drug should not be used, e.g. "Avoid in persons allergic to penicillin."

4. Assignment:

Consult again the student exercise that follows using the **PDR** or **USPDI**, verify that the information contained in the sample rows is correct, then complete the worksheet section, placing the page numbers in the spaces provided. An instructor will go over this with you.

When you have mastered the material an instructor will give you a quiz on the reference unit. Furthermore, your instructor will indicate any special conditions (e.g., age, sex, pregnancy) that may be present in the patient for whom each medication you will be looking up is to be administered. These special conditions will guide you in selecting *relevant* data from the reference.

Before you begin working in the **PDR** or **USPDI**, you may wish to preview Unit V, Part I. This is especially true if you have a limited background in anatomy and physiology.

Student Assignment 1 — Use of Drug References

Medication Classifications

DRUG CATEGORY	USUAL USE	COMMON SIDE EFFECTS	EXAMPLE	USUAL DOSAGE	DOSAGE FORMS/MISC	SPECIAL CONSIDERATIONS
1. Laxative p.____________	Saline laxative; antacid in smaller doses	None stated. See Special Considerations	Milk of Magnesia (Phillips) (M o M)	**Adult**: Laxative: 30-60 ml/dose taken with fluids usually @ H.S. Antacid: 5-15 ml up to 4 X day Maximum: 60 ml/day **Children**: Up to 1 yr: 2.5-5ml/dose; 1-12 yrs: 6.5-30ml/dose	Table Suspension This drug contains *no* salt	Can affect absorption of certain drugs (incl. antibiotics). Look for warning labels. Do not use when abdominal pain, nausea or vomiting are present
2. Antianxiety p.____________	Treatment of anxiety insomnia, convulsions, muscle spasms, alcohol withdrawal	—Clumsiness or unsteadiness —Dizziness or lightheadedness —Drowsiness (daytime) —Slurred speech —Unusual tiredness or weakness —Hallucination —Mental confusion	Valium (diazepan)	**Adult**: 2-10 mg 2-4 X day **Children**: 1-2.5 mg/Kg 3-4 X day	Capsules (extended release) Tablets Injection	Alcohol may potentiate. Warn against activities the require alertness or good coordination with CNS until response with drug is determined. Schedule IV.
3.						
4.						
5.						

Page numbers refer to the ________ Edition of the PDR or the 19______ Edition of the USPDI.

Assignment #2 Medication Classifications

DRUG CATEGORY	USUAL USE	COMMON SIDE EFFECTS	EXAMPLE	USUAL DOSAGE	DOSAGE FORMS/MISC	SPECIAL CONSIDERATIONS

Assignment: Determine the brand names of 5 medications routinely used in your institution. Complete this chart (or a similar chart) on the 5 medications. This assignment will be checked before the unit test is administered.

Helpful hint: In addition to the desired effects, all medications are capable of producing undesired effects often called 'untoward' effects.

These untoward effects may be broken into two classes:
1. side-effects
2. adverse reactions

Side effects are NATURAL, EXPECTED OFTEN, UNAVOIDABLE

Adverse reactions are UNUSUAL, UNEXPECTED, AND INFREQUENT.

The dividing lines are not clear.

Example I

1) You are to give a drug named "Robitet"® . When you look up this drug, you notice that it is:

A. a tranquilizer

B. an antacid

C. an emetic

*D. a tetracycline antibiotic

2) You should conclude that (all)

A. It is given to fight a variety of types of infection

B. it has side-effects common to all tetracyclines

C. these side effects/adverse effects may include
  1. indigestion; intestinal disturbances
  2. allergic (hypersensitive) reactions
  3. superinfections especially by fungi

3) Now, you must know

A. which resident?

B. which route?

C. what dose?

D. what time?

E. Are there any special considerations, warnings, or precautions?

F. Are there any unusual side-effects, specific to Robitet?

The written physician orders guide you in A—D. The medication reference will guide you for E and F.

Example II

Question: What should you do, after having given the Robitet?

Answer: To complete your *safe* and *therapeutic* resident care, you should verify that you have given:

—the correct drug

—in the right dosage

to the correct resident
at the proper time
via the prescribed route

You must document (that is, "chart") your actions in medication administration and then observe the resident for:
- improvement in his/her condition
- any "untoward" reactions

(Further charting then will be done. You will study what to do and how to do it later in Unit VI).

Occasionally it is *not* wise to suggest untoward reactions to the patient. Examples of *poor* suggestions are:

"You have been getting Esimil which can cause stomach upset. Have you felt nauseated today?"

"This medication, Isordil, can sometimes cause patient's skin to peel off. What is that rough area on your back?"

"Your Nolvadex may sometimes cause serious visual changes. How many fingers am I holding up right now?"

However it is wise to alert the resident to serious or seemingly alarming potential untoward reactions so that he/she may take the necessary precautions or at least rest assured that nothing bad is happening which staff had not anticipated. Consider these examples:

"Theragran", this vitamin, may cause your urine to become bright gold. Don't worry about it. This is normal and expected."

"Your doctor has ordered this Elavil to make you feel better. It can cause some dizziness, so don't get up right away. Sit a spell on the bed and hang your legs over the side. Don't change positions rapidly."

"The Robitet prescribed for your infection may cause a little loose stool. This is normal, but let me know if it becomes troublesome or if it lasts for more than a day or so."

Using a Medication Reference as a Problem Solver

As a general rule, staff members should:

1. Inform the resident as fully as possible as to

   what the medication is supposed to accomplish,

   what he/she might reasonably expect for side-effects and for adverse reactions,

   what precautions are necessary,

   whom to notify should something not "seem right".

2. Be aware of facility policies as to who provides this information to residents, and the amounts to be provided by various staff members.

3. Be aware that increasing levels of training, the ability and responsibility to provide **interpretations and assessments** likewise increases. A TMA must be extremely cautious in interpreting observations. It is far better to report questionable instances than to ignore them. This principle holds true even if one reports an observation that turns out to be insignificant.

When in doubt, consider the resident's welfare: **you may well be the only link between safety and injury or death!**

Unit IV Worksheet

Directions: Below are listed various situations in which drugs are used. Choose the one best answer. Base your choice on use of the PDR or USPDI.

1. An RN tells you that the resident in Room 314-B is on a potassium supplement. Of the following, the potassium supplement is most likely

A. Feramel

B. K-Lyte

C. Gynorest

D. Bensulfoid

2. An 82 year old resident with rheumatoid arthritis is given 20 mg of Aristopan (Triamcinolone), injected into his left hip. Which of the following is/are expected side or adverse reactions?

1. Increased susceptibility to infections
2. Mood or mental changes
3. Urinary retention
4. Weakness
   - A. 1, 2, and 3 are correct
   - B. 1 and 3 are corret
   - C. 4 only is correct
   - D. All are correct

3. A male client leads a very basic life and is on a vegetarian diet. However, he complains of serious insomnia, for which his physician prescribes Valmid. Which of the following should *not* be taken with Valmid?

A. foods heavy in fats which interfere with Valmid absorption.

B. potassium supplements

C. acidic beverages such as orange juice

D. alcohol

4. Marge Anderson has been a resident in your facility for six years. She has a skin condition for which her physician is prescribing a certain topical drug. Of the following, the topical drug is most likely

A. Haldol

B. Heprinar

C. Halog

D. Hygroton

5. A resident has severe motion sickness when traveling. Phenargan, 25 mg BID is ordered. Which of the following is the *least* serious side effect or adverse reaction of Phenargan?

A. shuffling walk

B. shortness of breath

C. shaking hands

D. drowsiness

6. An orthopedic resident has severe muscle cramps. His physician orders a muscle relaxant. This relaxant is most likely

A. Tapazole

B. Soma

C. Noctect

D. Dialume

7. An overweight resident has a prescription for "a short-term trial with an amphetamine in a plan of weight reduction based on eating less food." Which of the following is an amphetamine?

A. Parasal

B. Ovulen

C. Serpasil

D. Diamox

E. Benzedrine

8. A physician is visiting a resident who has been complaining of "severe, throbbing head pains." The physician decides to try a vaso-constrictor to provide relief from these migraine headaches. Which of the following might be prescribed.

A. Cafergot

B. Eskalith

C. Rauzide

D. Akineton

9. In the question above, which of the following clusters of side-effects would most likely be observed following use of the prescribed anti-migraine medication?

A. Sweating, constipation, gout.

B. Inability to concentrate; orthostatic hypotension

C. Numbness, tingling of fingers and toes.

D. Red-orange urine; formation of kidney stones.

E. Enlargement of the thyroid; irregular heartbeat.

10. A resident has a prescription for Bricanyl tablets. Most likely, this individual is experiencing difficulty with a certain body system, namely the

A. digestive system

B. nervous system

C. muscular system

D. gastro-intestinal system

E. respiratory system

Extra Credit

11. Wanda Johnson is a 45 year old resident who has pain from recent surgery. Her phsyican has prescribed "Darvon-N c̄A.S.A., 100 mg, tid, for relief of pain. May be given PRN.' Which of the following is **contraindicated** in Darvon-N c̄ A.S.A. therapy, due to its effects being enhanced?

A. Librium (Chlordiazepoxide)—an antianxiety agent

B. heparin—an anticoagulant

C. Elavil (Amitriptyline)—an antidepressant

D. Nardil (Phenelzine)—an M.A.O. inhibitor

Answers

1. B
2. D
3. D
4. C
5. D
6. B
7. E
8. A
9. C
10. E
11. B

Unit V
Key Words

"Pink-eye". An acute infection of the eye.	**Acute Conjunctivitis**
Presenile dementia. A decrease in cognitive (thinking) abilities, found in younger that expected persons.	**Alzheimer's Disease**
The study of body structure and the relation of its parts.	**Anatomy**
A blood condition characterized by a reduction in number of red cells (erythrocytes), or of the hemoglobin content of the red cells.	**Anemia**
A clutching pain in the chest.	**Angina Pectoris**
The absence or urine production by the kidney.	**Anuria**
Any variation from the normal rhythm of the heart beat, e.g. fibrillation.	**Arrhythmia**
Vessels of the circulatory system that carry blood **away** from the heart.	**Arteries**
"Hardening of the arteries". Changes in the blood vessel walls that cause them to lose their elasticity.	**Arteriosclerosis**
Inflammation of a joint.	**Arthritis**
An allergic condition in which the bronchioles tighten and interfere with exhalation.	**Asthma**
A defect in vision in which there is uneven focusing.	**Astigmatism**
A condition of blood vessel walls being coated with fatty deposits.	**Atherosclerosis**
The two upper receiving chambers of the heart.	**Atria**
Decrease in size of a cell, tissue, organ or part, e.g. as from non-use.	**Atrophy**
Defect in the ability to express oneself by speech or writing, or in understanding written or spoken language.	**Aphasia**
Very slow heartbeat, e.g. below 60 beats/minute.	**Bradycardia**
A sudden and unexpected stopping of the heart and blood circulation.	**Cardiac Arrest**
An abnormal growth, or tumor; cancer may be benign (non-spreading) or malignant (spreading and often lethal).	**Cancer (Carcinoma)**
The smallest blood vessels in the body, in which exchange of nutrients and gases (O_2 and CO_2) occurs.	**Capillaries**
An abnormality of the eye, characterized by the lens becoming opaque.	**Cataract**
The basic living unit of a plant or animal. Cells normally make up tissues.	**Cell**
The nervous system comprised of brain and spinal cord.	**Central Nervous System**
A disease of the liver characterized by fibrosis (an increase of connective tissue). Cirrhosis has been associated with alcoholism, but not all cirrhosis is caused by alcoholism.	**Cirrhosis**
A momentary loss of consciousness and loss of reflexes following head trauma, with loss of memory for the traumatic event, but resultant recovery.	**Concussion**
A situation in which the heart cannot pump strongly enough (e.g. from aging). The heart pumps so weakly that blood "backs up", e.g., into organs like the liver and kidneys (or in the tissue of the ankles).	**Congestive Heart Failure**
A condition of the bowels in which the feces are hardened and elimination is difficult and infrequent..	**Constipation**

Contraction	The mechanism by which muscles work - a shortening and tension of the muscle.
Contusion	A bruise on the surface of the brain. (More serious than a concussion).
Cyanosis	A bluish color of the skin (and nailbeds) due to lack of oxygen.
Cystitis	Infection of the urinary bladder.
Dementia	A general designation for mental deterioration.
Diabetes Mellitus	A disease in which the body is impaired in its ability to use sugar, and sugar appears abnormally in the urine.
Diarrhea	Abnormal frequency and fluidity of fecal elimination.
Diastolic Pressure	The second blood pressure reading, indicating pressure when the heart is at rest, between contractions.
Distribution	The second portion of the basic body processes of drug actions, in which the drug moves into body cells.
Diuretic	A drug that helps eliminate fluids, e.g. as given to those with hypertension.
Dysphagia	Difficulty in swallowing.
Dyspnea	Breathlessness, or shortness of breath, or difficulty with breathing.
Dystrophy	Degeneration of muscle.
Dysuria	Difficult or painful urination.
Edema	A condition in which abnormally large amounts of fluid are found in the tissue spaces of the body, especially in the feet and ankles, causing swelling of those areas.
EKG	(Electrocardiogram) A graphic tracing of the electric current produced by contraction of heart muscle (Ex:).
Embolus	A clot or plug that has moved from one vessel into another one, usually a smaller one, so as to obstruct the circulation.
Emphysema	Enlargment of the alveoli, usually due to narrowing of the bronchioles. The bronchioles can take in air during inhalation, but not all air is passed back - thus the alveoli expand to compensate. However, emphysema is progressive.
Encephalitis	An inflammation of the entire brain, usually caused by a viral infection.
Endometrium	The mucous lining of the uterus.
Epilepsy	A neurologic condition marked by recurrent seizures.
Excretion	The process of removing waste products.
Fatigue	A state of tiredness and decreased efficiency.
Fibrillation	A condition characterized by irregular convulsive (twitching) movements of the heart.
Fracture	A break in a bone.
Glaucoma	An eye condition characterized by increased pressure within the eyeball and progressive loss of vision.
Hematemesis	Vomiting of blood.
Hematuria	The presence of blood in the urine.
Hemoptysis	Coughing up blood.

Internal or external bleeding, usually profuse bleeding.	**Hemorrhage**
Farsightedness; an inability to see close objects.	**Hyperopia**
High blood pressure, e.g. 160/100. The lower reading (e.g. over 90mmHg) is most critical.	**Hypertension**
Removal of the uterus.	**Hysterectomy**
The protrusion of bowel through an opening in surrounding walls of the abdominal region.	**Inguinal Hernia**
A local lack of oxygen, e.g. to the heart, caused by a block in the arterial flow.	**Ischemia**
A "yellowish" appearance caused by deposition of bile pigment in the skin and mucous membranes.	**Jaundice**
The place of union between two or more bones of the skeleton.	**Joint**
Overproduction of abnormal, cancerous white cells (leukocytes).	**Leukemia**
A band of tissue that connects bones.	**Ligament**
Plasma like liquid which is derived from the blood, and contains white blood cells; helps to "clear up" infected areas of the body.	**Lymph**
Gland-like masses of tissue, found primarily in the armpits, groin, and neck, where body debris (e.g. bacteria, white cells) is deposited and filtered out from infected areas.	**Lymph Nodes**
Blood in the feces, usually evidenced by black, tarry stools.	**Melena**
The start of menstruation.	**Menarche**
An inflammation of the outer membranes of the brain, most often caused by bacterial infections.	**Meningitis**
The stopping of menstruation.	**Menopause**
The sum of physical and chemical processes by which substances such as food or drugs are broken down into simpler substances utilizable by the body.	**Metabolism**
The spontaneous abortion of a fetus, e.g. before six months of pregnancy.	**Miscarriage**
A progressive disease of the nervous system caused by loss of myelin in the brain or around the spinal cord, such that nervous impulses are not transmitted to the muscles. The muscles therefore become weaker.	**Multiple Sclerosis**
"Heart attack", in which part of the heart muscle dies due to lack of oxygen.	**Myocardial Infarct**
Heart muscle.	**Myocardium**
Nearsightedness; an inability to see far objects.	**Myopia**
Increased urination during the night -time.	**Nocturia**
Decreased urinary output, e.g. only 400 or 500 ml in 24 hours.	**Oliguria**
A part of the body, composed of tissues, that performs a special function.	**Organ**
Difficulty in breathing in any position except upright. Ex: difficulty in breathing while reclining.	**Orthopnea**
Degeneration of bone; e.g. it becomes more porous (softer).	**Osteoporosis**
Inflammation of the middle ear.	**Otitis Media**
The part that provides the electrical stimulation of the heart muscle. (Can also be an instrument implanted below the skin).	**Pacemaker**

Paralysis	Loss of muscle function, caused by injury or disease to the nerves, brain, or spinal cord.
Paresis	Weakness, especially muscle weakness.
Parkinson's Disease	A nervous disorder common to the elderly, marked by tremors, masklike facial expression, rigidy of skeletal muscles, and a shuffling gait.
Pathology	The study of disease—its origin, nature, and course.
Peripheral Nervous System	The nerves of the body as they leave or branch from the spinal cord.
Peristalsis	The wavelike movement of food along the alimentary canal, due to muscle contractions along the way.
Pharmacodynamics	The interaction between drugs and living things.
Physiology	The study of body function—in totality, or by parts.
Platelets	(Thrombocytes)—The small, cellular components of blood responsible for clotting.
Pleurisy	Inflammation of the linings (pleura) of the lungs and lung cavity.
Pneumonia	An inflammatoin of the lung(s) usually caused by bacteria or viruses.
Polyuria	Excessive urination, e.g. as in diabetes mellitus.
Proteinuria	Protein in the urine. This usually is a strong indicator of kidney disease.
Psoriasis	A chronic scaling skin disease, usually seen as bright red raised lesions, covered with dry, silvery scales.
Pulse	"Throbbing" caused by the regular contraction and alternate expansion of an artery. It is the periodic thrust felt over arteries (e.g. of the wrist), in time with the heartbeat.
Sphygmomanometer	A device for measuring blood pressure.
Stroke	(cerebrovascular accident)—A sudden neurologic deficit caused by hemorrhage or embolism in the brain.
Sign	An actual physical observation made by someone who examines a patient; examples of signs include a mass, tenderness, or abnormal heart sounds.
Symptom	Evidences (perception) of disease as made by the patient, e.g. he "feels nauseated," or has diarrhea, or feels pain.
System	A group of tissues and organs working together in a common purpose. Ex: gastro-intestinal system.
Systolic Pressure	The first blood pressure reading, indicating amount of pressure when the heart has just contracted.
Tachycardia	Excessive beating of the heart, e.g. over 100 beats per minute.
Tendon	A fibrous cord by which a muscle is attached to the bone.
Tissues	A collection of cells that do similar or related work. Tissues include blood or subcutaneous (fatty) tissue. Tissues group together to form organs.
Thrombocytopenia	A blood condition of a decrease in platelets (thrombocytes).
Thrombophlebitis	An inflammation of the wall of a vein, usually developing before the formation of a thrombus.
Thrombosis	The presence of a thrombus.

A plug or clot in a blood vessel.	**Thrombus**
A vessel carrying blood back to the heart.	**Vein**
The two lower cavities of the heart, responsible for propelling blood via the arteries into the lungs or the body tissues.	**Ventricles**
"Stomach flu." A common disease in which a virus causes diarrhea and vomiting, usually of a 24-hour duration.	**Viral Enteritis**
(leukocytes). Those components of blood responsible for fighting infection. Leukocytes are composed of neutrophils, lymphocytes, monocytes, eosinophils and basophils.	**White Cells**

Unit V
Body Systems and Drug Classification

Overview of Body Systems: Anatomy, Physiology, Pathology, Pharmacology

Introduction

This unit is composed of two parts:

1: Overview of Body Systems

2: Drug Classifications

Part I introduces 10 major systems, as well as the eye and ear, together with their anatomy, physiology, and pathology. Pharmacology is included in two systems in particular—the G-I and excretory, and as an introduction to Part 2, which is Drug Classifications.

The science of the body's "structure" **(anatomy)** is difficult to separate from the science of body "function" **(physiology)**, since both work together. **Pathology** is the study of "disease", while **pharmacology** is the science of drugs—their uses, and especially their "effects".

Symptoms are evidences of disease as perceived by the patient, such as pain, a lump, diarrhea. **Signs** are actual physical observations made by someone who examines a patient: examples include tenderness, a mass, or abnormal heart sounds.

Mortality and Morbidity

The five most common causes of death (mortality) in the United States include heart disease (40%), cancer (20%), stroke (13%), accidents (6%), and pneumonia (3%). (1981) Another way disease may be significant is in terms of disability (morbidity). Disabilities are health problems that interfere with a person's normal physical, mental, and emotional functioning. Disabilities include asthma, low back pain, bronchitis, loss of limb or limb functioning, as well as anxiety.

Aging

Man, like all species, has a finite life span. This life span is determined by the process of aging, a normal process affecting all individuals. Aging is progressive and irreversible. Its cause is not known, precisely.

Some diseases are difficult to separate from aging itself, because they occur to some extent in all individuals with time. These age-related diseases include arteriosclerosis, hypertension, degeneration of the skin, cataracts, arthritis, hearing loss, and loss of mental capacity. Other diseases, such as cancer, are age-associated, in that their incidence increases with age. Examples include chronic lung disease, or accidents as well.

The human life span is now about 85 years for women, 75 years for men. (The life span is that age at which 50 percent of the population will die from the effects of aging). Older individuals may die from respiratory infections, accidents, or exposure to cold, that would not have killed them at a younger age. The aging process begins at about age 17, but does not have a marked influence on death rate, until much later.

The aims of health care are to alleviate pain and disability, and to prolong life. Therefore, in order to understand *why* one administers medications, one must

BEST COPY AVAILABLE

understand the anatomy, physiology, pathology, and pharmacology of the body, and the effects that drugs will have on each.

Medicines are prescribed for their effects on cells, tissues and organs. No medicine is completely free of adverse (unwanted and potentially harmful) effects. By knowing where to look for drug reactions—Part 2 of this unit—as well as their desired, expected, or unexpected results, one improves his/her abilities to provide quality patient care.

Progression from Simple Cell to Complex Structure

The **cell** is the basic living structure of all plants and animals. Each cell is a living organism that takes in food (nutrients), gives off wastes (excretes), and reproduces (multiplies). Cells are of many types and shapes. They may live and work together to make up a larger organism, such as a plant, animal or human being. Most cells are very specialized in what they do. As an example, red blood cells (erythrocytes) carry oxygen through the body, while nerve cells carry feelings of pain.

When cells doing similar or related work group together, they form **tissues**. Blood is an example of tissue. Tissues group to make a more complicated structure called an **organ**, such as the heart or stomach. When different organs work together, they become a **system**. For example, the stomach and the intestines are organs; working together they form part of the gastrointestinal (G-I) system. Systems function together to become a complex structure, such as the human body.

System	Anatomy: Components or Major Organs (examples)	Physiology: Function
1. Skeletal	Bones, cartilage, joints	Support of body; protection of organs
2. Muscular	The muscles	Gives body movement
3. Nervous	Brain, spinal cord, other nerves	Controls and coordinates bodily activites
4. Circulatory (Cardiovascular)	Heart, blood vessels, blood, lymph	Carries nutrients and oxygen to the cells via the blood; removes wastes from the cell
5. Respiratory	Mouth, nose, trachea, lungs, bronchi, alveoli	Provides air (oxygen) to the cells and removes wastes, such as carbon dioxide
6. Reproductive	Ovaries, uterus (female). Testes (male)	Allows a new human to be born
7. Urinary	Kidneys, ureter, urinary bladder, urethra	Removes certain wastes
8. Gastrointestinal	Mouth, esophagus, stomach, liver, gall bladder, small and large intestine	Takes in food and prepares it for use by the body, and excretes wastes
9. Endocrine	Thyroid, pancreas, testes, adrenal glands...	Secretes chemicals, called hormones, which regulate body processes
10. Skin (tissue)	Skin	Protects the body from harmful germs; helps to regulate the temperature; serves an excretory function
11. Eye/Ear (organs)	Eyes and Ears	Sight; hearing

Part 1: An Examination of the Body Systems

Skeletal System

1. Anatomy:

The hard, supporting connective tissues around or within which the body of an animal is built are collectively known as the **skeleton**. The human body contains 206 bones, many of which have joints at their ends to connect them to adjacent bones.

The skeleton is first laid down as **cartilage**, which is later replaced by bone that is primarily calcium. The "soft bones" found in babies are composed early of cartilage. Not all cartilage is replaced by bone; the nose or structure of the ears are examples. Bone is living material which is constantly being torn down and rebuilt during the life of the individual organism.

2. Physiology:

The major functions of bone include
-providing a structural framework for attachment of muscles
-weight-bearing support
-protection to internal organs, from traumatic injury

In addition, the bone contains bone marrow, which makes the red cells, white cells and platelets of the blood.

The places where bones are connected to each other are the **joints**, e.g. the knee joint. The major function of joints is to allow and control the extent of movement between adjacent bones. The ends of bones are covered with soft layers of cartilege that cushion the joints; **ligaments** are strong bands of tissue that hold the bones together. Muscles are attached to bones by **tendons**.

3. Pathology:

By far the most frequent affliction of bone is **fracture** (break in the bone.) Fractures may be caused by trauma alone, or may be the result of the bone that had been already weakened by other disease, such as cancer. **Arthritis** is considered to be primarily a disease of joints.

Since most of the blood components are produced in the bone marrow, several diseases result from underproduction of certain cells, such as **anemia** (decreased red cells), or overproduction or cancerous white cells, e.g. **leukemia**.

Muscular System

1. Anatomy:

Muscle cells are unique in that they have the power of shortening and then returning to their original length, thereby creating movement, which is one of the basic characteristics of living things.

Muscles commonly known are the biceps located in front of the upper arm, or the **quadriceps** located in front of the upper leg.

2. Physiology:

Movement is accomplished by the shortening or **contraction** of skeletal muscles. Muscles pull, never push. Therefore, muscles work in opposite or **antagonistic** pairs. When one muscle pulls a limb in one direction, another muscle pulls it back. There are three basic muscle types: cardiac (heart), smooth, and skeletal muscle.

3. Pathology:

Skeletal muscle is a comparatively hardy tissue; nevertheless, some diseases can affect it. **Atrophy** is a decrease in tissue (muscle) size, such as that which occurs from non-use, or immobilization. **Dystrophy** (muscle degeneration) such as muscular dystrophy may be inherited, or as a result of nerve injuries or stroke. Weakness, then, is the common denominator of muscle disease; and it may result from a disease of the muscle itself or secondary to disease of the nervous system. **Paralysis** results when a group of muscles fail, because of a variety of causes, e.g. spinal cord injury.

Nervous System

1.-2. Anatomy/Physiology:

A many-celled creature needs systems of communication and control to coordinate all the activities of its complex body. At least two different systems operate to accomplish this interaction - a system of **nervous** control and a system of **hormone** control. For nervous control, environmental changes **(stimuli)** such as light or sound must be sensed by sensitive organs **(receptors)** such as the eyes, ears, taste-buds. A signal is set up in these receptors and carried over special fibers **(nerves)** to other organs. These other organs (e.g. muscles, glands) produce a response, either a movement or a secretion, respectively. In general, the nervous system provides for **internal** communication, among the organism's various body parts, and **external** communication between the organism and its environment.

In man and other higher animals, the nervous system may be compared to a telephone system. There is a **central nervous system** (CNS) comparable to the central switchboard and a **peripheral nervous system** (PNS) comparable to the transmission lines. The CNS is comprised of the **brain** and **spinal cord**, which is encased in bones called **vertebrae**, and connects the brain itself to the body parts by way of 31 pairs of **spinal nerves**.

The nervous system is responsible for communication and coordination between the various systems and structures of the body. It also allows the control of sensation, emotions, and learning. It is considered to be composed of the voluntary and involuntary nervous system. The "voluntary" nervous system can be divided into two main parts: the central nervous system (CNS) and the peripheral nervous system (PNS). The CNS and PNS consist of the brain and spinal cord (CNS) and other nerves (PNS). This system controls all **voluntary** activities.

Signals from the various body parts, both external and internal, are carried to the brain via the spinal cord. In turn, the brain sends signals to the body parts along other spinal-cord routes.

The peripheral nervous system (PNS) consists of the spinal nerves and the twelve pairs of cranial nerves. The chief function of the PNS is to send and receive signals to and from the brain.

Another nervous system, is the autonomic nervous system (ANS). The ANS is the part of the nervous system that carries signals to smooth muscle, cardiac muscle and glands. This is the **involuntary** nervous system, and includes reflex centers.

3. Pathology:

The major diseases of the central nervous system are cerebrovascular accidents (strokes), traumatic injuries, infections (meningitis, encephalitis), and tumors. Strokes are the third leading cause of death in the United States (behind heart attacks and cancer). Developmental disorders and degenerative diseases, such as multiple sclerosis, Parkinson's disease, and senile dementia, are also significant. Headaches and epilepsy are very important in terms of incidence but may be symptoms of a variety of diseases.

1.**Cerebrovascular accident (stroke).**

A stroke is a sudden embolism or hemorrhage into the brain. The damaged brain tissue loses function within minutes. If the motor cortex of the brain is affected, it will produce weakness **(paresis)** or paralysis on the opposite side of the body. If the dominant side of the brain (the side that primarily controls motor function, usually the left side) is involved, the patient will also have **aphasia** (impaired communication function).

Cerebrovascular accidents are also caused by rupture of vessels and bleeding to the brain (brain hemorrhage). The ruptured vessel has usually been weakened by arteriosclerosis, and the hemorrhage usually occurs in a patient with hypertension.

2. **Trauma.**

The brain is especially vulnerable to injuries in modern times with high speed transportation. Examples include concussion, contusion, and penetrating injury.

a. **Concussion.** Concussion is a momentary loss of consciousness and loss of reflexes following head trauma, with amnesia for the traumatic event and complete recovery. No structural damage can be detected in the brain.

b. **Contusion.** Contusions are bruises of the surface of the brain sustained at the time of traumatic impact.

c. **Penetrating injuries.** Most penetrating injuries are from bullets. The damage to the brain from a bullet is proportional to the square of the velocity of the bullet; consequently, high-speed bullets do much more damage to the brain than low-speed bullets. Other dangers from penetrating injuries are the impaction of fractured bone splinters into the brain plus the strong likelihood of introducing infection into the open wound.

Penetrating and crushing injuries of the spinal cord are very common and if severe, may result in complete paralysis of the body below the lesion.

3. Multiple sclerosis.

Multiple sclerosis (MS) is a disease that affects young and middle-aged adults. The basic lesion is focal loss of the myelin sheath (nerve covering) in the brain or around the spinal cord, which appears to make nerves incapable of properly transmitting a nervous impulse. Because this loss of myelin can occur anywhere in the brain or spinal cord, the symptoms may vary considerably from one patient to another. The cause of multiple sclerosis is not known. The disease span is usually 5 to 25 years, with the course of the disease alternately remitting and relapsing (getting better or worse), although the patient eventually becomes quite debilitated from muscle weakness.

4. Senile dementia.

Dementia means a decrease in cognitive (thinking) function, usually accompanied by loss of memory for recent events. Senile dementia is a descriptive term for a condition of elderly persons who have poor memory for recent events, pick at their clothes, get lost easily, and are often irritable. Although persons with this type of dementia are usually old, younger persons also develop the same disease pattern at times ("presenile dementia" or **Alzheimer's disease).** The brain is atrophied and is characterized microscopically by a degeneration of neurons. The cause of senile dementia is not known; some consider it part of the aging process.

5. Parkinson's disease.

Parkinson's disease is caused by degeneration of certain portions of the involuntary motor system. Parkinson's disease usually affects older people and results in tremors at rest, masklike facial expression, and rigidity of skeletal muscles. A shuffling gait is characteristic. Many older people appear to have minor degrees of Parkinson's disease, and about 10 percent of persons with Parkinson's disease will also be demented.

6. Epilepsy.

This is a condition of recurrent **seizures**. Seizures are disturbances of electrical activity in the neurons, which may be manifested by abnormal movements or sensations and loss of reflexes, memory, or consciousness. In most cases, persons with epilepsy have a long history of seizures without known cause. Seizures may also be due to more acute conditions such as electrolyte imbalance or high fever. (Seizure activity in persons with epilepsy is usually controlled with barbiturates or phenytoin type drugs).

7. **Brain tumors.**

Tumors of the brain and spinal cord are not as neatly separated into benign and malignant varieties as are tumors elsewhere. The reason is that small, slowly growing tumors of the brain that would be benign in other locations may readily disrupt vital functions in strategic locations, such as the brain stem, killing the patient. Other benign brain tumors may occur in deep areas of the brain where the surgeon cannot gain access to them without destroying adjacent vital brain structures. Thus, regardless of whether brain tumors are malignant or benign, they can be very serious.

8. **Meningitis/Encephalitis.**

Meningitis is an inflammation of the meninges (outer membranes of the brain); it is most often caused by bacteria which usually gain access to the brain and spinal cord via the blood; there, the bacteria and leukocytes (which try to counteract the bacteria) cause swelling, pressure within the brain, and if untreated, death. Treatment consists of immediate antibiotic therapy.

Encephalitis is an inflammation of the entire brain and is usually caused by mosquito-borne viral infections. There is no specific treatment, and patients either die, or recover—fully or with neurological problems.

The Circulatory (Cardiovascular) System

1. Anatomy:

The circulatory system has three main parts: circulating fluid (blood and lymph), enclosed tubes or ducts (arteries, veins, capillaries), and a pump (the heart) to keep the fluid moving.

Blood is carried throughout the body (away from the heart) in vessels called **arteries**. These branch into smaller and smaller vessels until they form **capillaries**. In the capillaries, the blood provides necessary substances e.g. oxygen and nutrients to the cells. The capillaries then group together into small veins which join to form larger **veins** that return the blood to the heart. Veins are bluish-appearing vessels and often lie very near the surface, just underneath the skin.

The exchange of nutrients between the blood and the cells occurs in the capillaries. In the capillaries of all body parts, extra blood plasma also filters out of the blood into the tissue spaces. In the tissue spaces, this liquid is called **lymph**. Lymph carries away waste products such as dead cells and debris, and is re-collected by a special network of capillaries and other vessels; it is returned to the bloodstream. **Lymph nodes**, located at the neck, armpits and groin, remove debris from the lymph and may be enlarged in infections.

The heart is a hollow muscle approximately the size of one's fist. The right side of the heart propels blood to the lungs, while the left side sends blood to all the body systems. The top of the heart consists of two receiving chambers, the **atria**; the pumping chambers, or the lower areas, are the **ventricles**.

The heart functions as two pumps working synchronously to move blood to all sites in the body. The right side of the heart receives unoxygenated blood and pumps it through to the lungs where it is oxygenated. The left side of the heart receives oxygenated blood from the lungs and pumps it to all areas of the body.

2. Physiology:

The right and left sides of the heart are critical to life and are dependent upon two factors. First, the muscle must have a generous supply of oxygenated blood to provide the fuel for its high-energy need. This blood is supplied to the heart muscle via two medium-sized arteries, the right and left coronary arteries. Second, an electric pulse ("**pacemaker**") is needed to initiate the rhythmical contraction of the heart. Each heartbeat is caused by a wave of electricity that passes from the pacemaker cells to the heart muscle (**myocardium**). The signals can be detected by an electrocardiograph (**EKG**) machine.

The circulatory system has several functions. Most importantly, it carries substances to and from the individual cells, providing oxygen and nutrients and removing carbon dioxide and other waste products. This sytem also circulates the **white cells** that protect the body from infection, and the **platelets** that are important for blood clotting.

The function of the heart and circulatory system can be measured in several ways. One is the blood pressure, which shows how hard the heart is working and how much pressure is being placed on the vessel walls. Blood pressure is the force of blood against vessel walls—measured in millimeters of mercury—and is composed of the **systolic pressure** (blood pressure when the heart is contracting), and the **diastolic pressure** (blood pressure between contractions, or resting), e.g. 120/80 mm mercury.

To measure blood pressure, an instrument called a **sphygmomanometer** is used. When an inflatable pressure cuff is inflated, it tightens around the patient's arm. As the cuff is released, at least two sounds can be heard: systolic and diastolic. Average blood pressure (BP) is about 120/80 mm (120 over 80), but variations suchas 140/85 or 90/65 are normal. Unusually high blood pressure is **hypertension**, e.g. 160/95 (the lower reading being over 90); unusually low blood pressure is **hypotension**, e.g. 50/30.

Another heart function is the **pulse** rate that simply indicates how fast the heart is beating, i.e., the higher the pulse, the faster the heart is beating. The heart alternately contracts and then relaxes about 72 times per minute (with a range of 60-80 beats/minute).

3. Pathology of the Cardiovascular System:

Any change in the rate, rhythm, and force of the heartbeat, or in the forces and quantity of blood flowing through the vessels endangers the entire body. Major diseases of the heart result from injury to cardiac muscle, damaged heart valves and increased work load for the pumps produced by altered blood flow or high blood pressure.

Insufficient supply of blood to the heart is called **ischemia** and is usually caused by narrowing of the main coronary arteries from atherosclerosis. It is by far the most common cause of death in the United States, and often leads to heart attack (**myocardial infarct**), which is death of a part of the heart muscle due to lack of oxygen.

Coronary Artery Disease: When blood vessel diseases develop in the arteries that supply the heart (coronary arteries), the functioning of the heart itself is endangered. **Angina Pectoris** is a clutching pain in the chest caused by oxygen starvation usually due to narrowed coronary arteries. Chest pain that lasts for more than 20-30 minutes may be a sign of a "heart attack."

Hypertensive heart disease, the second most common heart problem, is caused by high blood pressure in the arteries causing an increased work load for the heart.

Congestive heart failure results from the inability of the heart to pump strongly enough. This can be caused by aging, high blood pressure, dead or injured heart muscle, damaged heart valves, kidney malfunctions, or blood vessel diseases. The heart pumps so weakly that blood backs up in the veins and body organs. Important organs like the liver and kidneys can be affected. Blood pressure is high and fluids leak into the spaces between cells, causing edema.

Arrhythmias are conditons in which the entire heart or parts of the heart muscle do not beat properly. Instead, they may vibrate (**fibrillate**), skip contractions, or beat very rapidly (**tachycardia**), Arrhythmias occur because the electrical signals that control the heart rate and rhythm are disturbed.

MALFUNCTIONS OF THE BLOOD VESSELS ARE OF SEVERAL TYPES:

1. **Thrombosis** occurs when blood clots form within a blood vessel. This can be due to inflammation, or narrowed vessels. The stationary clot is called a **thrombus**. The thrombus blocks the flow of blood to the part of the body served by that particular vessel. The body part becomes pale and cold and sometimes bluish (**cyanotic**). A vessel that is partially blocked by a blood clot may become inflamed, resulting in the condition called **thrombophlebitis** (**phlebitis** means an inflammation of a vessel). If a thrombus breaks off into the blood vessel, it can circulate through the blood. It is then called an **embolus**. (An embolus can also be an air bubble or any kind of particle that can block a vessel). It may travel to another part of the body and cut off the blood circulation to a vital area, such as the brain.

2. **Arteriosclerosis**, better known as "hardening of the artieries," is due to changes in the blood vessel walls that cause them to lose their elasticity. The vessel walls can then become clogged with fatty deposits (**atheroschlerosis**), that, in turn, affects circulation. Arteriosclerosis is a serious problem because it can lead to heart attack if it affects the coronary arteries.

3. **Hypertension**, or high blood pressure, is a chronic (long-term) disease whose causes are not well understood. In hypertension, the small vessels stay tightened instead of expanding and contracting as spurts of blood are pumped into them by the heart. This indicates that the blood flows through them under great pressure, and the heart has to work harder to pump against this pressure. Over a period of time it can badly weaken the heart and affect the vital organs. It also weakens the vessels themselves, so that one of them may burst at any time. If an artery in the brain bursts, it can cause a "stroke," or cerebrovascular accident (CVA) which damages brain cells. Hypertension can result from several diseases, but the most common type of hypertension has no real known cause.

Symptoms of Circulatory Disorders

Symptoms of cardiovascular problems may include the following:

1. Breathlessness (**dyspnea**), a feeling of difficult breathing, which can occur at any time.

2. **Chest pain** is a symptom of some types of heart diseases. It can be caused by a lack of blood in the heart muscle, by inflammation of the heart, or by nervous tension.

3. **Edema** is the swelling of body tissues due to a leaking of fluid into the spaces between cells. It occurs in cardiovascular disorders when the blood is not being pumped quickly or strongly enough. Some of the blood fluid "backs up" in the tissues, and swelling results, especially in the ankles.

4. **Irregular heartbeats** or palpitations may indicate a problem with heart functioning. Persons may complain that their heart is pounding or jumping or missing a beat. Other disturbances of the heartbeat are **tachycardia** (very rapid heartbeat—pulse above 100 per minute) and **bradycardia** (very slow heartbeat—pulse below 60 per minute).

5. Coughing up blood is **hemoptysis** and may indicate serious cardiovascular disease where blood is leaking into the lungs. **Hemorrhage** indicates internal bleeding, caused by ruptured organs or faulty blood clotting.

6. Other symptoms are **fatigue**. When the heart or vessels are not functioning at their best, the tissues do not receive all the oxygen they need. When the oxygen content in the blood is low, the skin may turn bluish, a condition called **cyanosis**.

7. **Cardiac arrest** means a sudden and unexpected stopping of the heart and blood circulation. It can be brought on by many things, such as electric shock, severe allergic reactions, drug overdose, and surgery. Unless immediate steps are taken to restore heartbeat, cardiac arrest is fatal.

1. Anatomy:

The respiratory system provides an extensive, thin, moist membrane for exchange of gases, and a means of transporting the gases to and from the body cells. Humans draw air into their **lungs** by way of openings in the nose and a series of tubes (**pharynx**, **larynx**, **trachea**, **bronchi**, and **bronchioles**). The actual exchange of gases occurs in the thin, delicate, moist air sacs (**alveoli**) at the ends of the tiniest tubes.

The actual inhaling and exhaling are mechanical processes determined by differences in air pressure. These differences are created by breathing movements of the **diaphragm** and **ribcage**. The rhythmic breathing movements are controlled by a complicated feedback system involving the respiratory center in the medulla, an area of the brain.

2. Physiology:

The respiratory system provides oxygen to the blood and allows for the disposal of carbon dioxide. It is in the **alveoli**, the tiny air sacs within the lungs, that the exchange of oxygen and carbon dioxide takes place.

The nose is a passageway for breathing and also partially filters air. Its upper portion contains the sense organ for smell. The pharynx serves as a passageway for air, provides the musculature for swallowing, and contains the openings of the "**eustachian tubes**", which serve as pressure outlets for the middle ears. The pharynx also contains abundant lymphoid tissue, which aids in the recognition of foreign materials and microorganisms. The larynx is a major air passage to the lungs and contains the vocal cords.

Blood gases influence many bodily functions, including respiration and circulation. A small deviation from the correct ratio between oxygen and carbon dioxide can result in **acidosis** (blood pH too low), or **alkalosis** (blood pH too high). The pH of the blood should be between 7.35 to 7.45 (7.25 - acidosis). This is a very narrow range; and when its limits are exceeded, many additional problems can result.

A drug such as alcohol is partially excreted through the respiratory system and can be used in the "Breathalizer" test.

3. Pathology:

Pneumonia is an inflammation of the lung that is usually caused by bacteria or viruses. When severe, pneumonia affects pulmonary function and leads to systemic effects of infection. Those dying of pneumonia frequently have had poor lung function from chronic lung disease, or from heart failure, or have deficient defense mechanisms against infection in general. Others develop pneumonia as a terminal event following lingering illnesses such as cancer.

A number of degenerative and low-grade inflammatory conditons of the lung include chronic bronchitis, pulmonary emphysema, and fibrosis; these lead to ineffective exchange of air. There are two principal reasons for the poor air exchange—enlargement of alveoli (**emphysema**), resulting in sluggish air movement; and thickening of the alveolar wall, resulting in poor diffusion of gases, especially of oxygen (**fibrosis**). Emphysema is a very common problem that increases in frequency and severity with age and is related to smoking. Pulmonary fibrosis is less common, often associated with emphysema, and occurs most strikingly in miners exposed to inhalation of silica particles.

Carcinoma of the bronchi is the most common type of lung cancer; it arises in the major bronchi as a result of long-standing irritation, such as smoking.

Asthma is a prevalent disease that is extremely debilitating in some persons. Asthma is usually caused by allergens such as pollen which cause bronchial spasm in sensitized persons.

Pleurisy is an inflammation of the linings (pleura) of the lungs and lung cavities. Here, the individual feels knife-sharp pains or "stitches" in the chest area, along with a mild fever.

Difficulty with breathing is called **dyspnea**. **Orthopnea** refers to difficulty in breathing while reclining.

Reproductive System

1-2. Anatomy/Physiology:

Sexual reproduction, introduces the possibility of variation and change, in short, "individuals." In every case of sexual reproduction, there is a union of two cells to form a single one. The union (**fertilization**) causes growth of an embryo, then fetus, then baby.

The reproductive system is the only body system in which the organs of a male differ radically from those of a female. The male produces **sperm** in the **testes**, which are suspended outside the body. The sperm are conducted, via small ducts to the **urethra**, which runs through the **penis**. The penis is used to inject the sperms into the vagina of the female. The female produces **eggs** in the **ovaries**. These are discharged at the rate of one, or more, per month. The egg travels down the **fallopian tube**. During this time, the lining of the **uterus** is thickening as it prepares to receive a fertilized egg. If a developing **embryo** arrives in the uterus, it implants itself in the lining and established a **placenta** and grows as a **fetus**. If, however, the egg is not fertilized, the uterine membrane is discarded through the process of **menstruation**. A new membrane is then developed the next month.

Female Genital Organs

Female genital organs include the **vulva** (**labia majora**, **labia minora**, **clitoris**), **vagina**, **uterus** (**cervix** and **body**), **fallopian tubes**, and **ovaries**. The body of the uterus is a muscular organ with a glandular lining. The muscular wall stretches and grows during pregnancy, and its contraction is important in accomplishing childbirth. The lining is the site of implantation and growth of a fertilized egg.

The fallopian tubes have the specialized function of transport of ova (eggs) from the ovary to the body of the uterus.

A complex endocrine control system is responsible for the changes of **menarch** (onset of menstruation), pregnancy, and **menopause** (cessation of menstruation).

Male Genital Organs

Diseases of the male genital organs may be discussed with diseases of the urinary tract because of the close anatomic relationship of the male genital organs and lower urinary tract. However, for purposes of separation, the testes and prostate gland will be discussed here.

The testes consist basically of the tubules where sperm are produced. Sperm are stored in the tubules (and are propelled along during ejaculation by muscular contraction).

The male **prostate** encircles the neck of the bladder. Prostatic secretions comprise the major portion of semen and have a high antibacterial activity.

3. Pathology:

Female Genital Organs

The most frequent health problems of the female genital system relate to providing birth control, cancer screening, treating infections, preventing complications of pregnancy, and evaluating menopausal symptoms. The most serious complications of pregnancy include abortion, and hemorrhage at the time of delivery. More common but less life-threatening complications of pregnancy include spontaneous abortion (**miscarriage**), iron-deficiency anemia, or toxemia of pregnancy.

Sexually transmitted (venereal) infections are an important public health problem. Gonorrhea is very prevalent among adolescents and young adults. Females are usually asymptomatic carriers of this disease, but they may develop mild symptoms of inflammation of pelvic inflammatory disease which is more severe and may result in infertility, or necessitate **hysterectomy** (removal of uterus).

Cancers of the female genital organs are fairly common. Carcinoma of the cervix is diagnosable in its precancerous stages by periodic inspection of the cervix and examination of cells from its surface (Pap Smear).

Male Genital Organs

Enlargement of the prostate is very common in older men. Cancer of the testes can occur in younger men.

Urinary System

1. Anatomy:

Several organs act together to excrete metabolic wastes (i.e., wastes resulting from the breakdown of compounds in the living cell.) Of these, the urinary system does the most work in excretion. About 75% of the body's waste is excreted as **urine**, a watery, yellowish liquid. (The skin and the lungs also have excretory functions). The urinary system consists of two **kidneys**, each having a duct (the **ureter**), that leads to the **urinary bladder**. A single tube (the **urethra**) leads out of the bladder. The urethra opens to the outside.

Urine is constantly being formed in the kidneys. It trickles down the ureters toward the bladder, which stretches to accommodate it. Most persons produce about 1400 ml of urine each day.

2. Physiology:

The kidneys are organs that receive blood from the renal arteries. The kidneys' function is to regulate the concentration of salt, water, and hydrogen ions in the body, and to excrete waste products or foreign substances such as drugs and their metabolities. To accomplish this, the kidneys receive 20 percent of the circulating blood each minute.

3. Pathology:

Bacterial infections are the most frequent problems affecting the kidney and the lower urinary tract. Bladder infection (**cystitis**) is common in females, because bacteria gain access to the bladder via the short female urethra. For men, prostatic enlargement may cause obstruction of the urethra which may cause kidney as well as bladder infections. Kidney stones are fairly common problems in adults.

Diseases of the kidneys such as nephrosis or nephritis are collectively of major importance, since they are the major cause of chronic kidney failure. Cancer ot the bladder and of the prostate are relatively common in older individuals.

Most patients with cystitis or urethritis experience increased **frequency** of urination, **dysuria** (painful urination), or **nocturia** (increased night time urination). In addition the urine may be clouded by pus. Diseases of the kidney cells may cause **hematuria** (blood in the urine), **proteinuria** (protein in the urine), or systemic signs such as edema and hypertension. Kidney stones characteristically cause intense, sharp **flank pains** that radiate toward the groin. Destruction of the kidney tubules often is manifest by decreased output of urine **(oliguria)** or even complete absense of urine **(anuria)**.

Gastrointestinal System: Alimentary Canal and Liver/Pancreas/Gall Bladder

1. Anatomy:

Before a food can be put to use, it must be broken down into fundamental units, that are then reassembled in some new form. This breakdown of food is known as **digestion**. Organs of digestion comprise the **gastrointestinal** (G-I) or **digestive system**. This is composed of the 1) oral region—mouth, salivary glands, pharynx; 2) lower alimentary tract—esophagus, stomach, small and large intestines and 3) accessory organs—liver, gallbladder, pancreas.

111

Digestion occurs in assembly-line fashion in a tubular **digestive tract** that begins with the **mouth** and ends with the **anus**. In humans, the digestive tract or **alimentary canal** consists of mouth, pharynx, esophagus, stomach, small intestine, large intestine, rectum, and anus.

The small intestine is the most important organ for digestion and absorption. Nutrients are absorbed through millions of **villi** on the lining of the small intestine. Waste products are not absorbed, but continue on into the large intestine, where water and mineral salts are withdrawn. The solid waste material (**feces**) is stored in the rectum, and eventually eliminated via the **anus**.

2. Physiology:

The esophagus is a tube that serves to carry food to the stomach. The stomach cells secrete hydrochloric acid enzymes that aid in digestion.

Digestion and absorption occurs in the small intestine. The colon is a storage reservoir for undigested food and also is a site of water absorption.

In order for the intestinal tract to carry out its job of digestion, absorption, and excretion, the contents must be propelled along the tract at an appropriate rate. A wave of muscle contractions (**peristalsis**) carries swallowed food down the esophagus.

The **liver** secretes bile that helps break down fats. The liver is the largest glandular organ in the body. Of the many metabolic functions of the liver, the most important are 1) production of bile salts to help digest fats, 2) excretion of bilirubin (a product of red cell breakdown), 3) production of certain vitamins such as D, E & K, 4) production of serum protein and 5) detoxification of drugs and poisons.

The bile ducts of the liver form a long treelike network with the common bile duct emptying into the small intestine at the same point as the pancreatic duct. The **gallbladder** is an outpouching of the common bile duct that acts as a storage reservoir for bile. The gall bladder empties its contents into the intestine at a time (after meals) when bile salts are needed for fat absorption.

The **pancreas** is a long, narrow organ lying in the midabdomen. The pancreatic duct runs the length of the pancreas and empties into the small intestine after joining the bile duct.

Scattered among the pancreatic glands are clusters of endocrine cells known as the **Islets of Langerhans**; these produce insulin. Removal of the entire pancreas or severe destruction will produce diabetes due to lack of insulin. Insulin therapy is therefore vital to life.

3a. Pathology of the Alimentary Canal:

Constipation refers to infrequent and/or difficult evacuation of feces. **Diarrhea** refers to frequent and liquid stools. Constipation is freqently associated with a low-bulk diet as well as with aging. Diarrhea may be a manifestation of anxiety or may be due to organic disease.

There are many diseases of the alimentary tract that cause temporary or prolonged disability but are rarely fatal. The most common of these is **viral enteritis** (intestinal flu). Flu symptoms include nausea, vomiting and diarrhea.

Inguinal hernia is an outpouching of the abdominal cavity into the groin that may trap loops of bowel. Acute **appendicitis** is the most frequent indication for operations on the alimentary tract itself. Diseases of the anus are common and an important source of discomfort to patients; mild anal problems include hemorrhoids.

Common conditions that require more extensive health care include ulcers, cancer of the colon, and inflammatory bowel disease (ulcerative colitis and Crohn's disease). Lesions of the alimentary tract with a low survival rate include cancer of the esophagus, cancer of the stomach, and "esophageal varices" (bleeding from the esophageal blood vessels, especially in alcoholics).

Dysphagia is difficulty in swallowing. **Hematemesis** is the vomiting of blood. Severe bleeding in the tract may also produce **melena** (black, tarry stools), a common sign of ulcers.

3b. Pathology of Gallbladder/Liver:

A common problem occurs in the gallbladder, namely, the formation of gallstones.

Viral hepatitis is probably the most common liver disease, particularly in younger people. It usually gets better but occasionally persists many months; more rarely it develops into a serious chronic inflammation leading to cirrhosis. **Cirrhosis** refers to the liver becoming composed of fibrous tissues; it is the characteristic lesion of serious chronic liver disease regardless of cause. Chronic alcoholism is the most common cause of cirrhosis, but only some chronic alcoholics develop cirrhosis. The most common cancerous condition of the liver is carcinoma that has arisen from another site and then travelled to the liver.

Jaundice (yellow color) is an obvious and often serious sign of liver disease. It may be caused by liver disease or bile duct obstruction.

Endocrine System

1-2. Anatomy/Physiology

The endocrine system is the second system (in addition to the nervous system) coordinating body activities. The endocrine system—or **ductless gland** system—produces chemicals (**hormones**) that are dumped directly into the blood stream; they circulate in the blood. These hormones can be compared to chemical messengers, each of which has a specific **target organ** or organs which it influences. In man the endocrine system consists of at least 10 such glands, of which eight will be discussed:

1. **Thyroid gland**—produces several hormones such as thyroxine that control the rate of metabolism. Location: lower neck.

2. **Parathyroid glands**—produce a hormone that controls calcium use. Location: on thyroid.

3. **Adrenal glands**—produces hormones that prepare the body for "fight or flight" in cases of emergency. Location: on kidneys.

4. **Pancreas**—produce hormones, one of which is insulin that is involved in controlling sugar metabolism. Location: in abdomen.

5. **Pituitary gland** (also called the master gland)—regulates growth, reproduction, muscle contraction and blood pressure. Location: in brain.

6. **Gonads**—or "sex glands" are the testes in males and the ovaries in females. The gonads produce hormones that regulate maturation and reproductive system functioning. Location: in or near pelvis.

7. **Thymus gland**—in children, this gland is very large and secretes compounds useful in protecting from disease; it is responsible for early immunity. As the child matures, this gland diminishes, until, in adulthood, it has almost disappeared. Location: behind breastbone (sternum).

8. **Hypothalamus**—monitors hormone levels in the blood and contols the production of pituitary hormones. Location: brain, above pituitary.

3. Pathology:

Diabetes mellitus is the most common and important endocrine disease. **Goiter** (enlargement of thyroid) is also common.

Most endocrine disorders will reveal themselves as either a "hypersecretion" or a "hyposecretion" of a particular hormone. The diagnosis depends upon correctly matching the patient's symptoms and signs with hormone dysfunction and with laboratory confirmation of overproduction or underproduction of a particular hormone. For example, overproduction of insulin will decrease blood sugar levels, and the patient will have measurable symptoms and signs of hunger, pallor, shakiness, and decreased ability to perform mental tasks. On the other hand, too little insulin (diabetes mellitus) leads to increased blood sugar levels, and the patient presents with excessive urination (**polyuria**), and excessive drinking, because the body is attempting to excrete the excess glucose.

The names of the conditions caused by deficiency or excess of the various hormones are given below:

DISEASES ASSOCIATED WITH DEFICIENCY AND EXCESS OF VARIOUS HORMONES

Hormone	**Hormone-Deficiency Diseases**	**Diseases Associated with Excess Hormone**
Adrenocorticotropic hormone/glucocorticoids	Addison's disease	Cushing's syndrome
Growth hormone	Pituitary dwarfism	Gigantism; acromegaly
Antidiuretic hormone	Diabetes insipidus	Inappropriate ADH-secretion syndrome
Thyroid hormones	Cretinism; hypothyroidism	Hyperthyroidism
Parathroid hormone	Hypoparathyroidism	Hyperparathyroidism
Insulin	Diabetes mellitus	Insulin shock

Skin

1.-2. Anatomy/Physiology:

The skin consists of an outer covering of **epidermis**; an underlying layer of connective tissue (**dermis**), that contains the hair follicles, sweat glands, blood vessels, and sensory nerves; and a deep layer of adipose (fatty) tissues (**subcutaneous tissue**).

The skin functions as a barrier between the body and its external environment, protecting the body from injury by external forces and preventing excessive loss of body fluids. The skin also constitutes a major sense organ: sensations of touch, temperature, pressure, and pain are essential for man to maintain orientation with his environment. In addition, the skin plays a vital role in regulation of body temperature, both by controlling the amount of blood brought near the surface for heat exchange and through the process of sweating, which lowers skin temperature.

3. Pathology:

Among the more common dermatologic (skin) problems that may require medical attention are severe cuts, abscesses, acne, moles, warts, eczema, and rashes of various types. Older persons who have been exposed to sunlight for many years frequently have small precancerous lesions or early skin cancers on exposed surfaces. Psoriasis is a chronic, scaling skin disease, which sometimes is quite distressing to the patient.

Life-threatening skin conditions include extensive burns, severe drug reactions with the peeling off of portions of the epidermis, and malignant melanomas.

Loss or destruction of large areas of epidermis such as by burns is potentially killing because of the resulting loss of body fluids, and because of the high risk of secondary infection by bacteria.

Two other organs should be discussed: the eye and ear.

Eye/Ear

A. Eye

1.-2. Anatomy/Physiology:

The eyeball sits inside a bony structure and is protected by the eyelid. Lashes on the eyelid help to keep dust and dirt from entering the eye. At the edge of the eyelid is a **lacrimal gland** that produces tears to keep the eye moist and wash away dust particles. Tears are drained off through the tear ducts into the nose. The eye sockets and the eyelids are lined with mucous membranes called the **conjunctiva**.

The eye itself is made up of many parts that work together to produce sight. The **cornea**, the **iris**, the **pupil**, and the **lens** act like a camera and project patterns of light and dark onto the **retina** at the back of the eye. The **optic nerves** (one from each eye) carry information about these patterns to the brain. The brain then decodes the information into moving pictures.

3. Pathology:

The most common overall problem affecting the eyes is a **decrease in vision**. Approximately one-third of the population wears eyeglasses for correction of **myopia** (nearsightedness), **hyperopia** (farsightedness), and **astigmatism** (uneven focusing.) Injury to various parts of the eye, especially to the cornea, can lead to pain and disability.

Acute conjunctivitis, colloquially called **pink-eye**, may occur by itself or be associated with another infection such as upper respiratory infection. **Cataract** is an opacity of the lens leading to decreased vision; cataracts most commonly arise spontaneously in elderly persons. **Glaucoma** is a disease caused by an increase in pressure within the eye, with resultant damage to the optic nerve and its fibers inside the eye. Tumors of the eye are relatively rare.

B. Ear

1.-2. Anatomy/Physiology:

The ear is a complex organ designed for hearing. It also plays a part in the body's sense of balance. It has three basic parts: the external ear, the middle ear, and the inner ear. The external ear consists of an outer **auricle** that projects from the head, and an ear canal. Glands in the external ear produce wax. Small hairs in the canal move this wax toward the outer opening. The wax protects the ear by trapping foreign materials and dust.

Hearing begins when the external ear picks up sound waves from the environment. The ear canal carries the sound waves to the **eardrum**, that vibrates with the sounds. The vibrations of the eardrum are picked up by three tiny bones in the middle ear. These bones transmit the vibrations to specialized hearing cells in the inner ear. These cells are linked to the brain by means of the **acoustic nerve**.

Other cells in the **inner** ear detect changes in body position and therefore help to regulate balance.

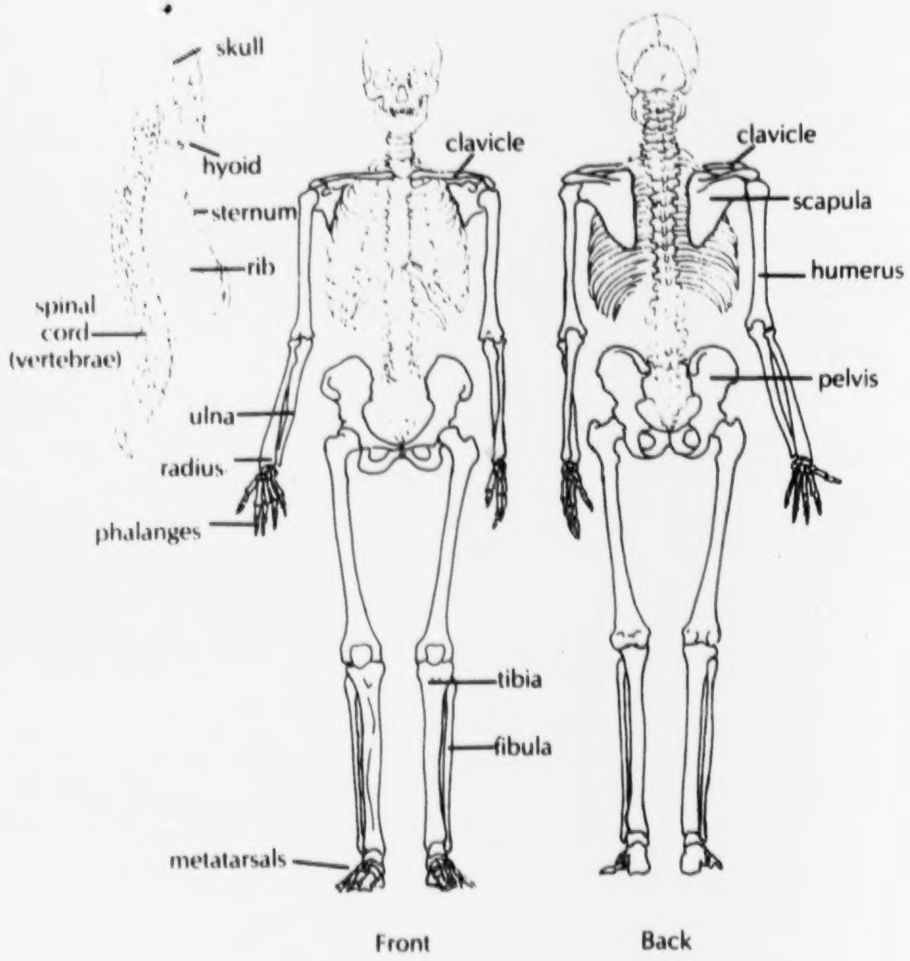
3. Pathology:

Any person with a detectable hearing impairment may be described as "relatively" deaf, although the essence of deafness as we generally use the word is the inability to hear and understand the spoken voice. The prevalence of deafness increases lineally with age to the point where over 60 percent of persons above the age of 65 have a major impairment of hearing.

Otitis media is inflammation of the middle ear. It is most common in young children as a result of upper respiratory infections. Swelling of the pharynx causes obstruction of the eustachian tube, with resultant spread of infection through the eustachian tube to the middle ear. In most instances, the otitis media is presumed to be caused by bacteria. Antibiotic therapy usually is curative, although some children are subject to repeated episodes of otitis media.

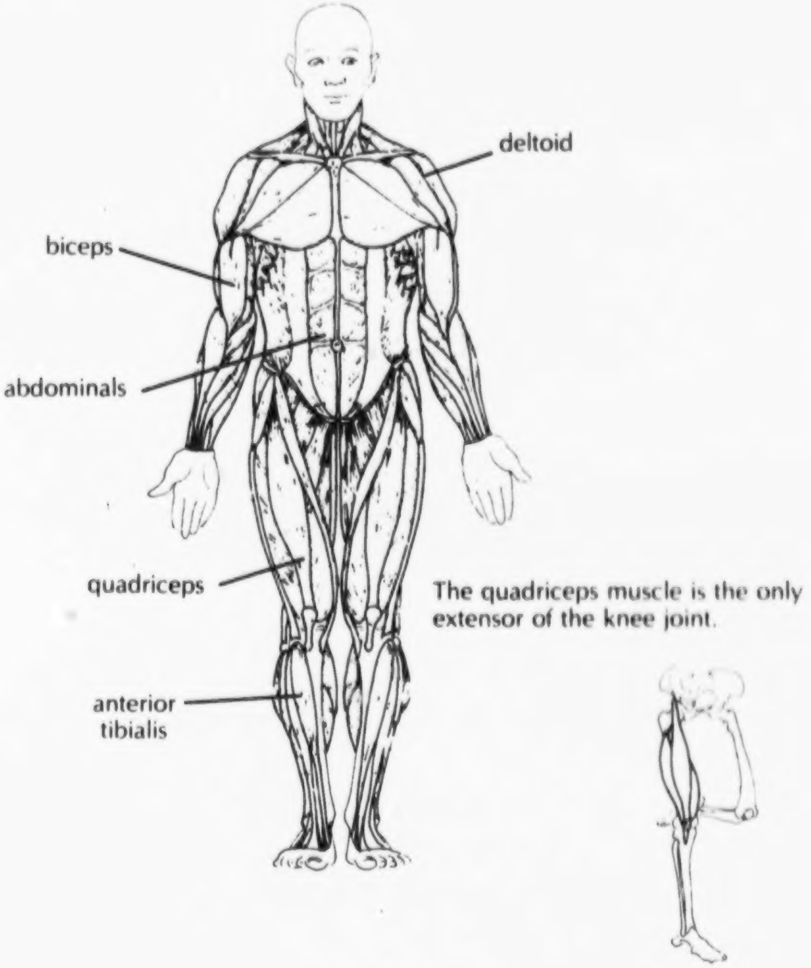
117

Fig. 5-1
Skeletal System


skull
hyoid
sternum
rib
spinal cord (vertebrae)
ulna
radius
phalanges
metatarsals
clavicle
tibia
fibula
clavicle
scapula
humerus
pelvis
Front
Back

The principal supportive structure of the body. Includes the skull, vertebrae, sternum, ribs, and hyoid bone.	**Axial Skeleton**
These bones provide for relatively free motion of the upper and lower limbs.	**Appendicular Skeleton**

Fig. 5-2
Muscular System


deltoid
biceps
abdominals
quadriceps
anterior tibialis

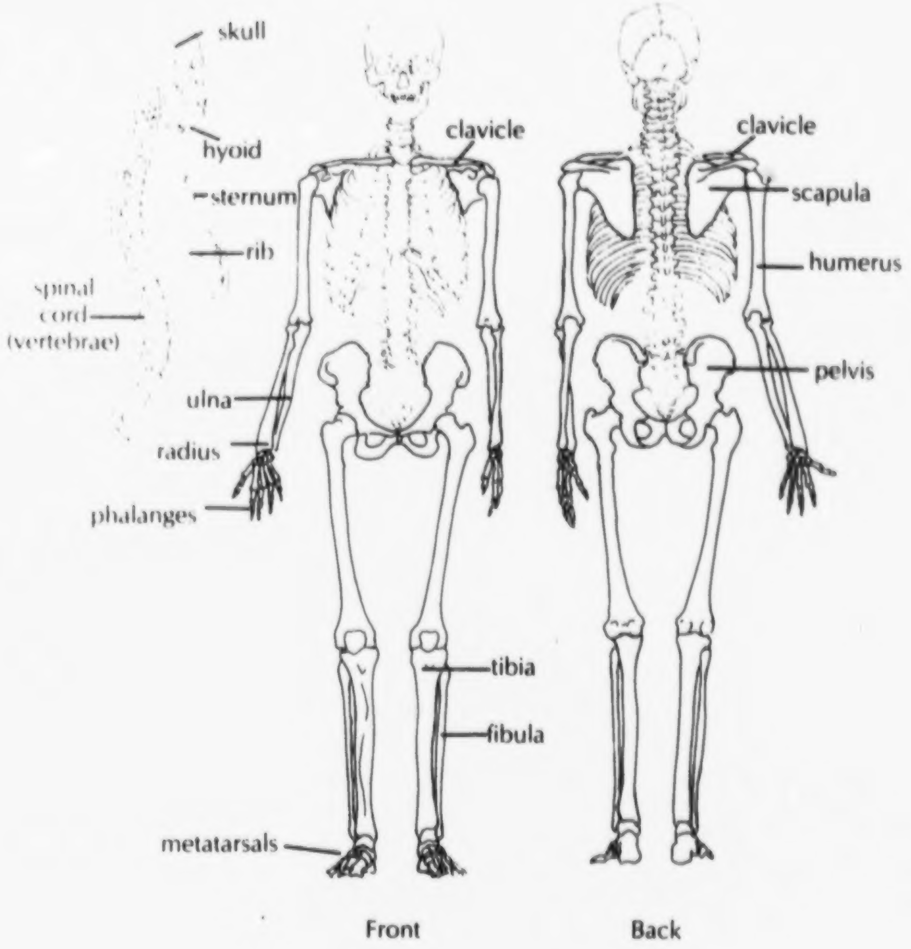
The quadriceps muscle is the only extensor of the knee joint.

Muscular System

The body is moved primarily by muscle groups, rather than individual muscles. Muscles work in antagonistic pairs; one pair causing movement in a certain direction, while the other opposing muscles cause movement in the opposite direction.

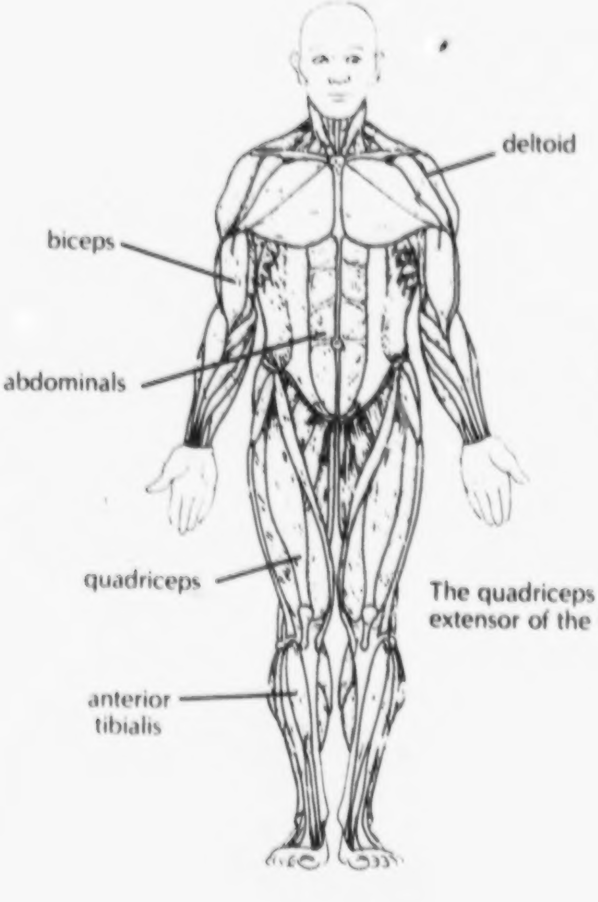
A typical joint (muscle-bone-tendon) is seen as well.

Fig. 5-1
Skeletal System


skull
hyoid
sternum
rib
spinal cord (vertebrae)
ulna
radius
phalanges
metatarsals
clavicle
tibia
fibula
clavicle
scapula
humerus
pelvis
Front
Back

The principal supportive structure of the body. Includes the skull, vertebrae, sternum, ribs, and hyoid bone.	**Axial Skeleton**
These bones provide for relatively free motion of the upper and lower limbs.	**Appendicular Skeleton**

Fig. 5-2
Muscular System


deltoid
biceps
abdominals
quadriceps
anterior
tibialis

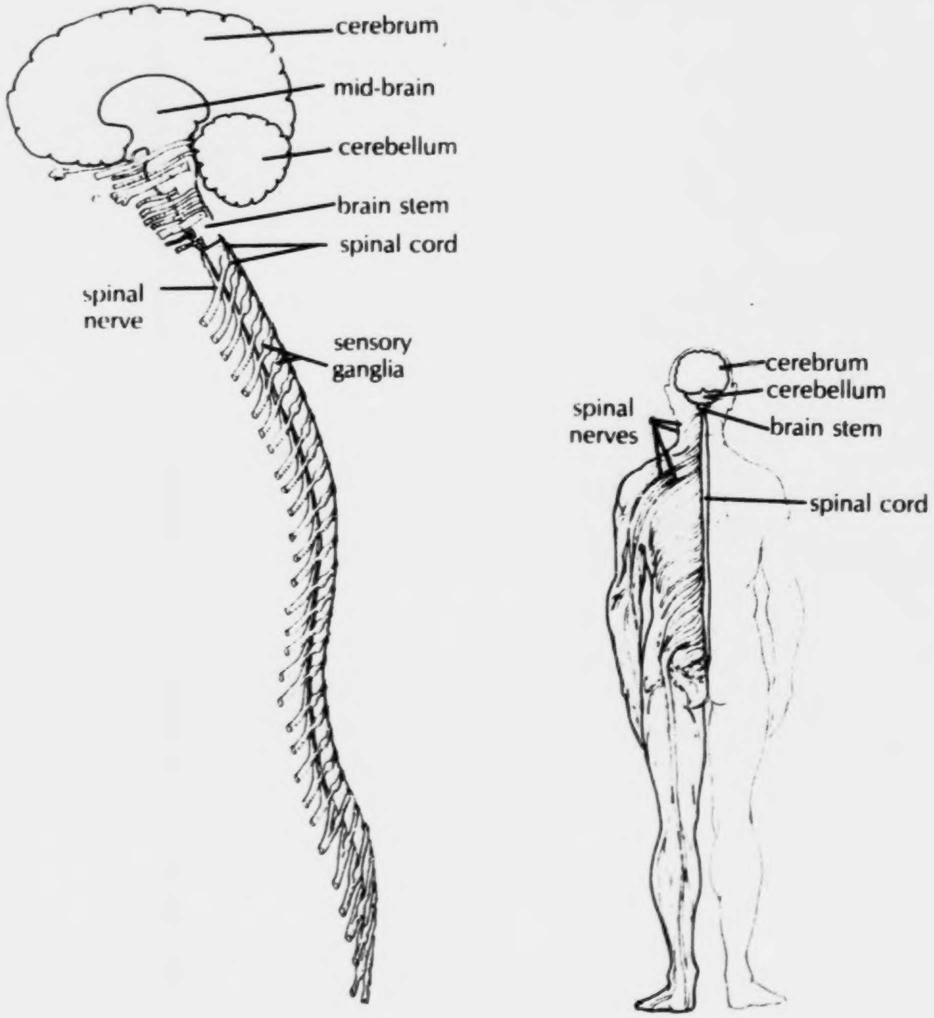
The quadriceps muscle is the only extensor of the knee joint.

Muscular System

The body is moved primarily by muscle groups, rather than individual muscles. Muscles work in antagonistic pairs; one pair causing movement in a certain direction, while the other opposing muscles cause movement in the opposite direction.

A typical joint (muscle-bone-tendon) is seen as well.

Fig. 5-3
Nervous System


cerebrum
mid-brain
cerebellum
brain stem
spinal cord
spinal nerve
sensory ganglia
cerebrum
cerebellum
spinal nerves
brain stem
spinal cord

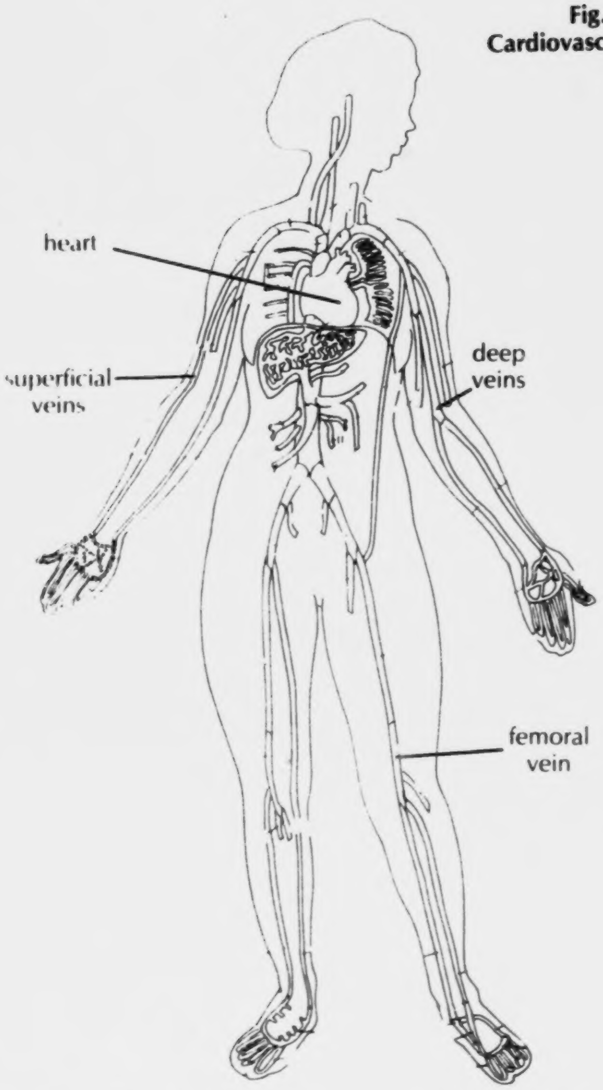
Central Nervous System

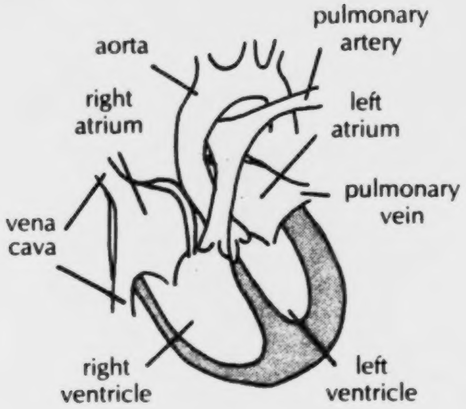
The central nervous system (CNS) consists of the brain (cerebrum, cerebellum, brainstem) and the spinal cord. It has functions of coordination, integration and transmission.

Peripheral Nervous System

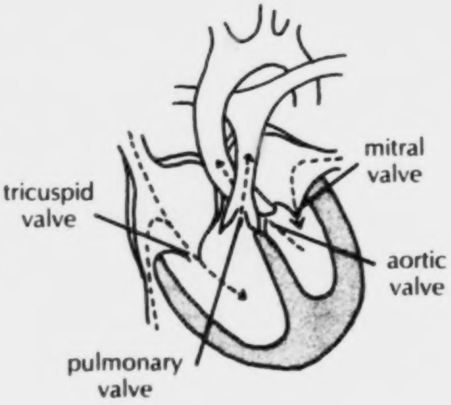
The peripheral nervous system (PNS) consists of nerve bundles that radiate to all parts of the body.

Fig. 5-4
Cardiovascular System


heart
superficial veins
deep veins
femoral vein


aorta
pulmonary artery
right atrium
left atrium
pulmonary vein
vena cava
right ventricle
left ventricle

Great vessels and chambers of the heart.


mitral valve
tricuspid valve
aortic valve
pulmonary valve

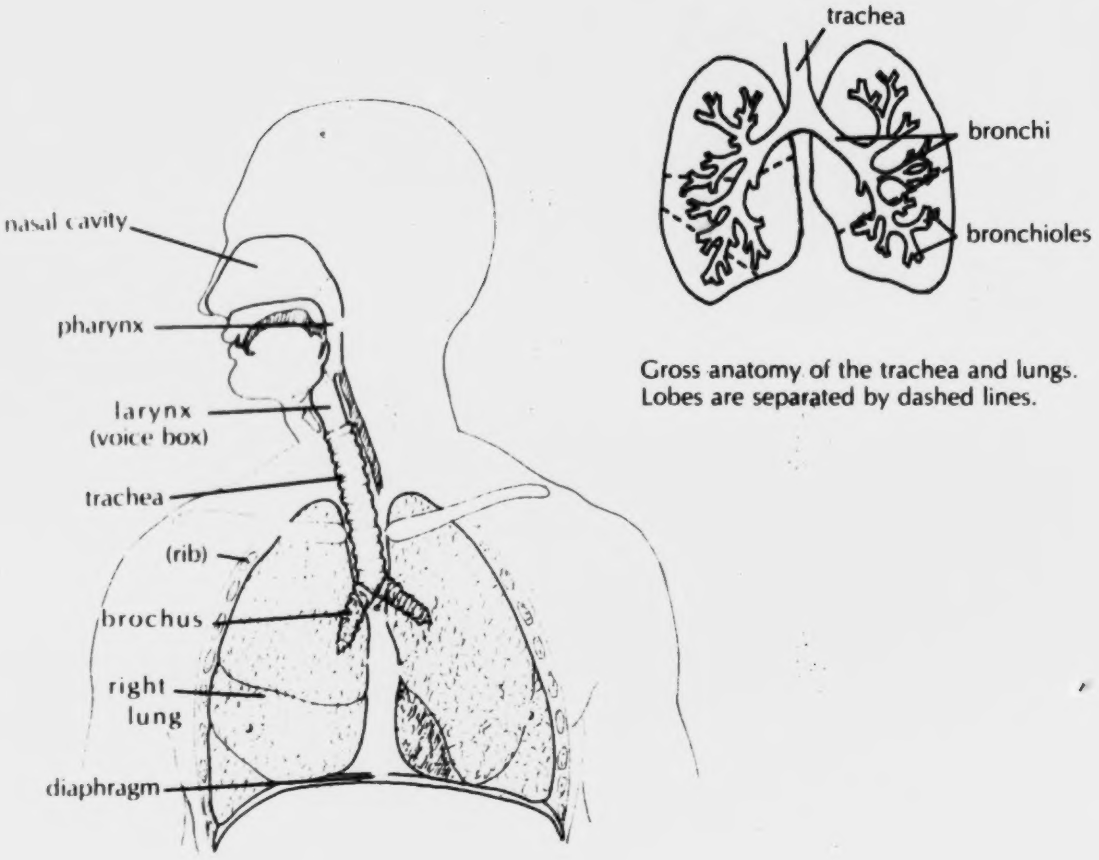
Cardiovascular System

This system is a closed system made up of:
a pump—the heart
a fluid—blood & lymph
tubes—the vessels

The blood provides nutrients to body cells, and assists in removing certain wastes.

Several veins are shown here. Arteries follow similar paths.

Fig. 5-5
Respiratory System

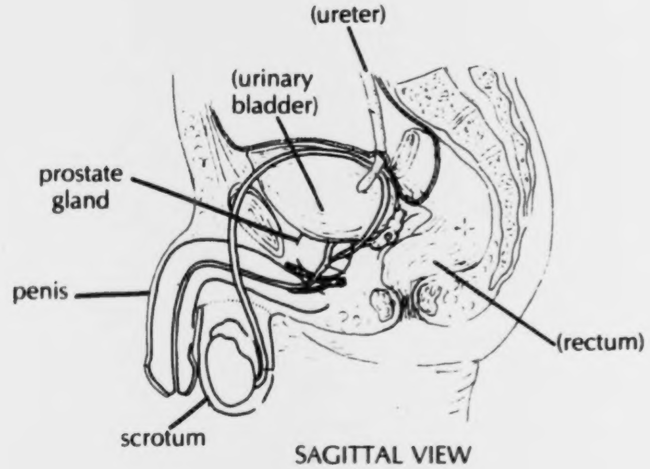

trachea
bronchi
bronchioles
nasal cavity
pharynx
larynx
(voice box)
trachea
(rib)
brochus
right
lung
diaphragm

Gross anatomy of the trachea and lungs. Lobes are separated by dashed lines.

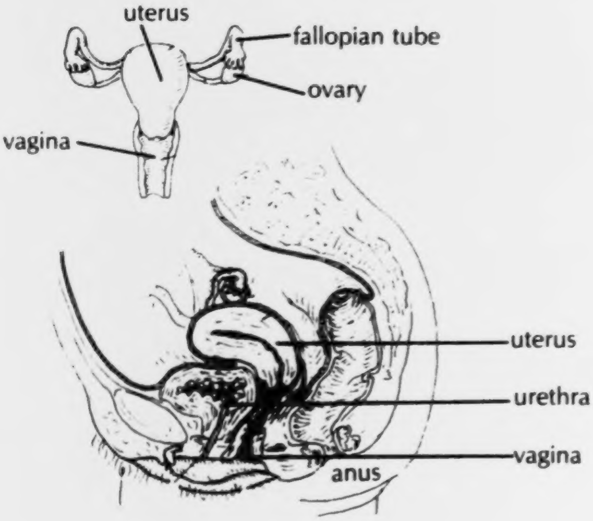
Respiratory System

The respiratory system brings air to the lungs where O_2 can be absorbed by the blood. It removes CO_2 (as well as some water), and exhausts them to the outside. The respiratory tract also helps to develop sound into speech through the larynx.

Fig. 5-6
Reproductive System


(ureter)
(urinary bladder)
prostate gland
penis
(rectum)
scrotum

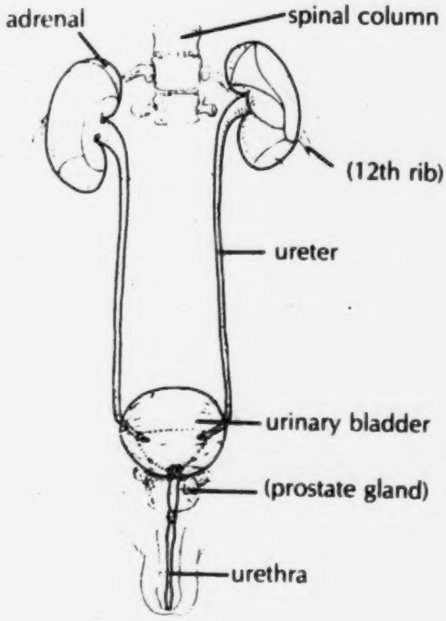
SAGITTAL VIEW
(schematic)

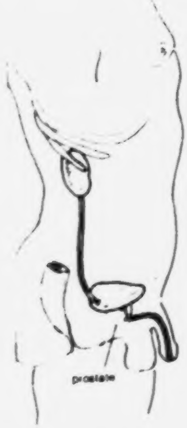

uterus
fallopian tube
ovary
vagina
uterus
urethra
vagina
anus

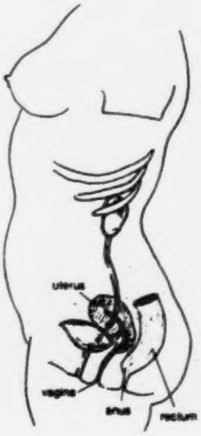
SAGITTAL VIEW

Reproductive System These two systems differ greatly from the male to the female. Note that male reproductive organs are essentially outside the body. Female structures are primarily inside the body where the fetus can be protected during development.

Fig. 5-7
Urinary System


adrenal
spinal column
(12th rib)
ureter
urinary bladder
(prostate gland)
urethra



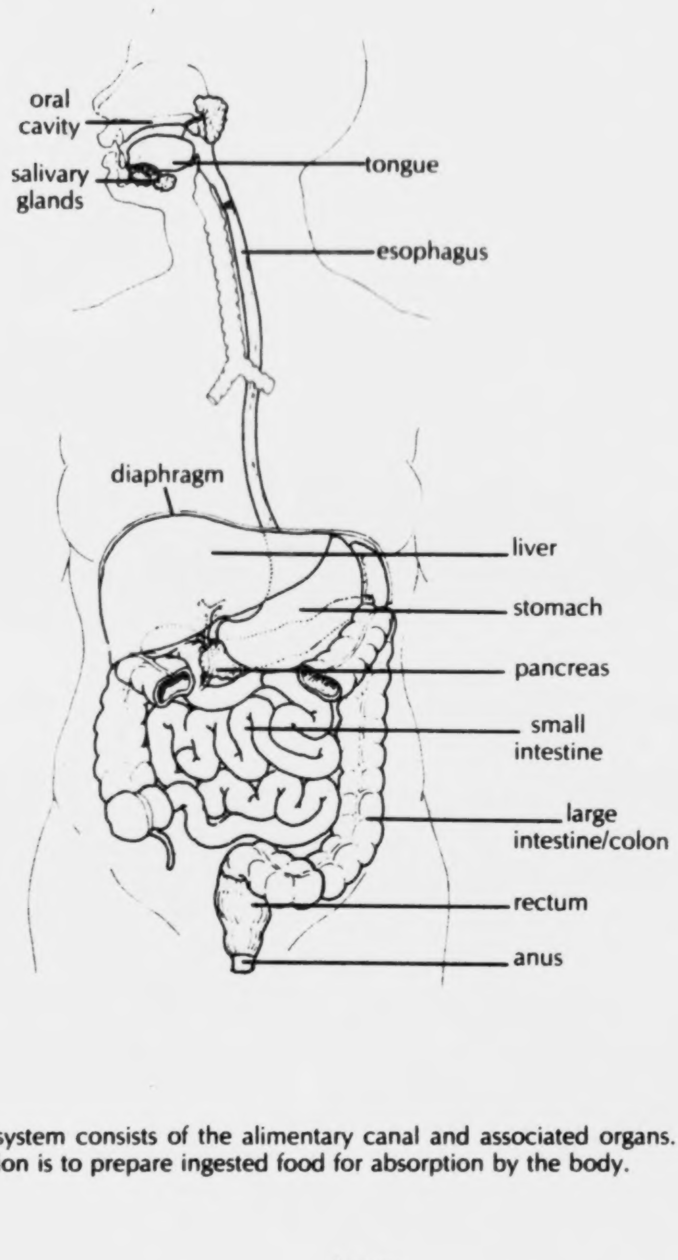

uterus
vagina
anus
rectum

Urinary System

Part of the excretory system, it represents a pathway for the release of byproducts and unessential chemicals dissolved in water. The kidneys have a major role in preserving "electrolyte balance."

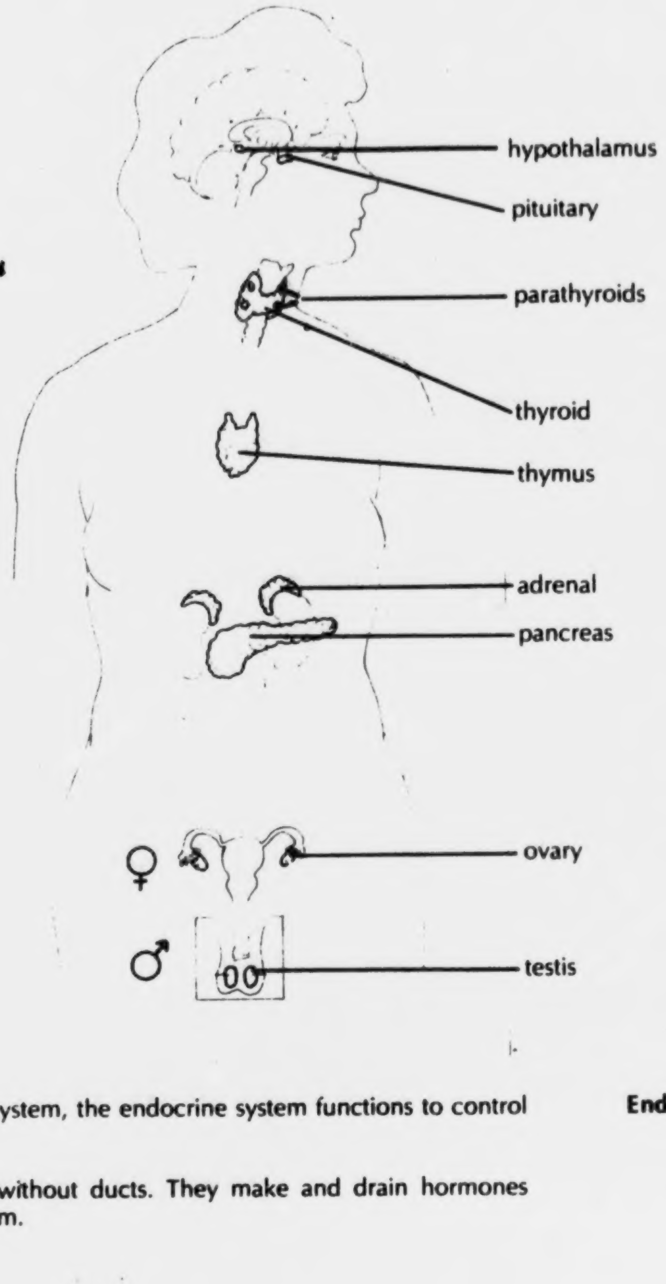
Fluid and electrolyte balance refer to the amount, type, and position of "electrolytes" (sodium, potassium, chloride, carbonate) found.

Fig. 5-8
G-I System


oral cavity
salivary glands
tongue
esophagus
diaphragm
liver
stomach
pancreas
small intestine
large intestine/colon
rectum
anus

G-I System This system consists of the alimentary canal and associated organs. Its chief function is to prepare ingested food for absorption by the body.

Fig. 5-9
Endocrine System

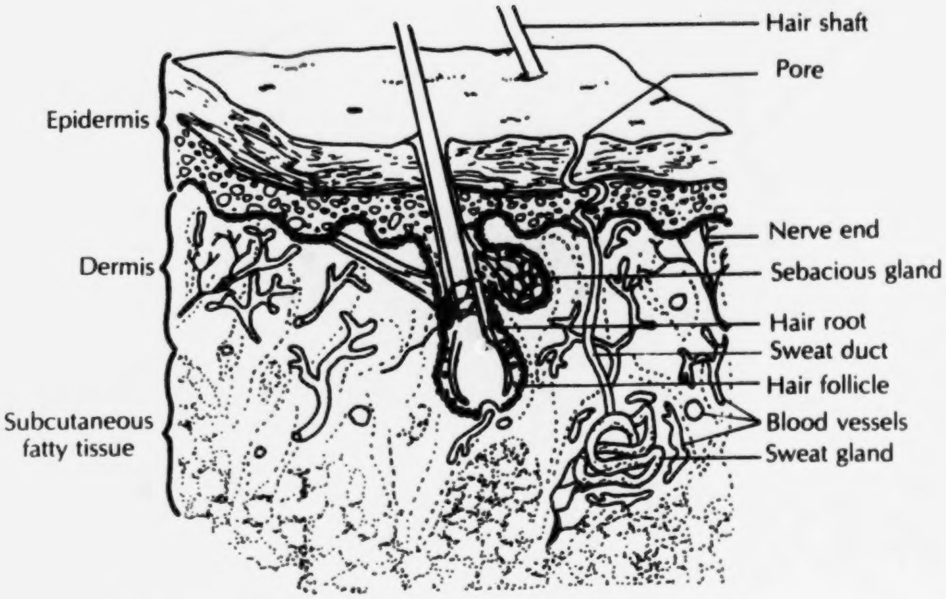

hypothalamus
pituitary
parathyroids
thyroid
thymus
adrenal
pancreas
♀
ovary
♂
testis

Endocrine System

Working with the nervous system, the endocrine system functions to control various body processes.

The endocrine glands are without ducts. They make and drain hormones directly into the blood stream.

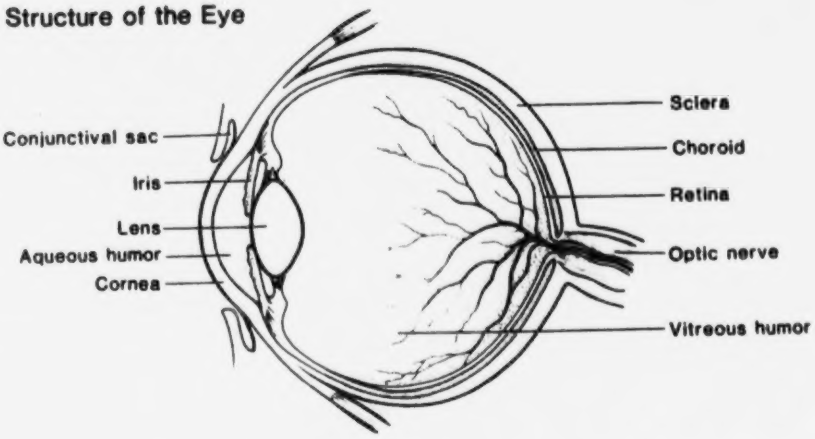
Fig. 5-10
The Skin


Hair shaft
Pore
Epidermis
Nerve end
Dermis
Sebacious gland
Hair root
Sweat duct
Hair follicle
Subcutaneous fatty tissue
Blood vessels
Sweat gland

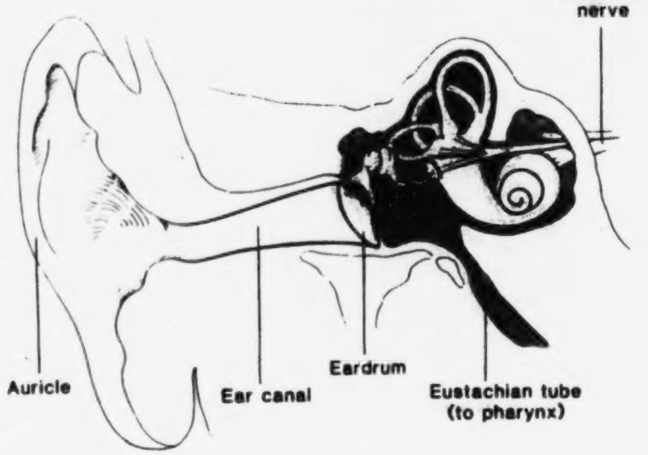
The Skin

A typical cross-section of skin is shown here. Skin plays an important role in protecting the body against invasion by bacteria and viruses, chemicals, and certain radiation. It assists in regulating body temperature, serves as a sensor to inform one about the state of his/her environment (e.g. temperature, wetness et al.). It also keeps one's insides intact, preventing them from "leaking out."

Structure of the Eye


Conjunctival sac
Iris
Lens
Aqueous humor
Cornea
Sclera
Choroid
Retina
Optic nerve
Vitreous humor

Structure of the Ear


Acoustic nerve
Auricle
Ear canal
Eardrum
Eustachian tube (to pharynx)

Pharmacology and the Body

A. Pharmacology: Definition

Pharmacology is the study of the uses and actions of drugs within the body.* Specifically, pharmacology is the study of drugs: their sources, chemical makeup, preparation, and uses in everyday life. Pharmacology includes the study of how specific chemicals affect the human body. In medicine, we are concerned with drugs that help prevent, diagnose, and treat human disease. Drugs for our use then are called **Therapeutic** drugs.

Pharmacology attempts to describe both the desired effects and the side effects of drugs. It focuses, too, on the proper amounts of drugs to be given and on how drugs are given. Knowledge of the laws and responsibilities surrounding drug use, along with practical experience in giving medication, will equip you to play a vital role in the health care team.

Drugs are essential elements in the care of patients or clients. However, they can be abused - with serious results. The safe administration of medications requires sound and current knowledge of any drug's:

1. mode of action
2. side effects
3. toxicity
4. range of dosage
5. rate and route of excretion
6. idiosyncratic responses
7. interactions with other drugs

You will not be required to have in-depth knowledge in each of the above seven areas. Nurses, along with physicians, dentists and pharmacists, are usually held legally responsible for a safe and therapeutic drug regimen. However, each care-giver is liable for his/her actions or non-actions (omissions) when proper care is not provided. This includes medications that are not administered as ordered. For example, a licensed nurse is not exonerated (exempt) from certain responsibilities when drugs are administered by others. Indeed, *all* members of a health-delivery team may be held liable for a single injury to a client. It is only through education, training, proper supervision and a realization of one's own limitations, that safe and effective care may be rendered to those for whom we are responsible.

Pharmacodynamics means the interaction between drugs and living things such as the human body. It refers to the chemical changes that drugs cause in the body cells, and how those chemical changes alter body functions. Drug **action** describes the way drugs cause chemical changes in body cells. Drug **effects** are the physical changes that occur in the body as a result of the drug action.

When a person takes a drug, the outcome depends on how that drug affects one or more groups of body cells. Drugs usually either slow down or speed up the ordinary processes that the cells carry out. For example, stimulants speed up the energy-producing functions of cells. Some drugs destroy certain cells or parts of cells. For example, antibiotics kill disease germs; and radioisotopes of cobalt kill cancer cells. Other drugs act to replace or supplement natural substances (e.g. thyroxin) that the body lacks because of an organ malfunction or poor nutrition.

To summarize, drug action consists of (1) slowing down, or depressing, the normal work of cells; (2) speeding up, or stimulating, the work of cells; (3) destroying cells of cell parts; or (4) replacing substances that the body lacks or fails to produce.

Once a drug is taken, it enters into certain processes that go on in the body at all times. These processes are the body's normal means of using food and oxygen to produce energy. Drugs are treated just like any other substance that enters the body, such as food or liquids. The only difference is that each drug interacts in a different way with the normal processes carried on by body cells. These interactions are determined by many things: the size and shape of the drug molecules, their ability to dissolve in water or fat, the pH balance of drugs and cells, or the electrical charges of molecules. The details are not as important as an understanding of four basic body processes that affect drug actions: **Absorption, Distribution, Metabolism, and Excretion**.

1. **Absorption:**

No matter where they enter the body, sooner or later most drugs pass into the bloodstream and circulate throughout the body. The passage of a substance from the site of administration into the bloodstream is called **absorption**.

2. **Distribution:**

After a drug is absorbed into the bloodstream, it is carried throughout the body by the blood. Some of the drug passes out of the bloodstream through the thin walls of the capillaries. The drug then enters body cells through pores in the outer cell layers. It may also pass right through cells into the fluid-filled spaces between the cells. This movement of the drug into the body cells and into the spaces between the cells is called **distribution**.

Distribution is affected by the chemical makeup of the drug, the amount of drug given, and cell conditions such as temperature and pH. If distribution is slow, the effect of the drug is not felt until some time after administration. If distribution is fast, drug effects are noticed almost immediately after administration.

3. **Metabolism:**

After a drug has reached body cells and done its work, the process of metabolism begins to occur. This is a series of physical and chemical reactions that break down the drug into different substances that are easier for the body to eliminate. This is a natural process much like the digestion of food. It is necessary so that the body can rid itself of the waste products that are left over after the cells make use of nutrients or drugs.

---

*Note: Persons may be confused by the terms "pharmacology" and "pharmacy". Pharmacology, as stated above, is the study of drugs. Pharmacy refers to the act of preparing chemical substances for use in medication therapy or to a place where drugs are prepared by a pharmacist.

Enzymes are special body juices that speed up the process of metabolism. They cause chemical reactions to occur many thousands of times faster than they ordinarily would. **Most of the metabolism of drugs takes place in the liver**. This very important organ is responsible for many body chemical reactions. (A smaller amount of metabolism also takes place to some extent in the lungs and the intestines).

Some drugs cannot work on body cells UNTIL they are broken down chemically, so that metabolism actually changes them into effective drugs. Other drugs become inactive and lose their power to work on body cells when they are metabolized. With some drugs this is good, because if these drugs were to remain unchanged in the body, they could collect and cause harm.

4. **Excretion:**

Excretion is the body's way of removing the waste products of ordinary cell processes. Drugs are excreted in the same way as other waste products. Most drugs leave the body through the kidneys and the large intestine. In the kidneys, blood is filtered and liquid waste products collect in the form of urine. In the large intestine, undigested solid wastes collect in the form of feces.

Some excretion also takes place in the lungs, where gaseous wastes, such as carbon dioxide and some types of drugs, are collected from the bloodstream. These are excreted when a person exhales. Anesthetic gases such as ether are sometimes excreted through the lungs. (Milk glands also excrete some types of drugs. This is an important fact to know when giving medications to nursing mothers).

If a drug is excreted quickly, its effects are short-lived. If it is excreted slowly, its effects last longer. The rate of excretion depends on the chemical composition of the drug, the rate of metabolism, and how often the drug is administered. The condition of the excreting organs will also determine how quickly and completely excretion takes place.

Factors Affecting Drug Action

No two people are exactly alike, and no drug will affect every human body in exactly the same way. Body cells differ according to a person's age, size, sex, genetic inheritance, physical and emotional condition, and biorhythms. These personal characteristics may cause slightly different drug actions in several people given the same drug. Factors surrounding the administration of medications may also cause differences in people's responses to a drug. The route of administration, the time of day, the number and size of doses, and the environmental conditions all play a role in drug action.

Unit V
Part 1 Worksheets

Worksheet #1
Body Systems

Multiple Choice. For each item, select the one best answer.

1. Which of the following represents the **largest** functioning unit in the human body?

A. tissue

B. organ

C. cell

D. system

2. Which of the following is most responsible for "detoxifying" drugs such as alcohol?

A. pancreas

B. liver

C. lungs

D. adrenal gland

3. In the urinary system, which of the following is located **furthest away**, in distance, from the kidneys?

A. bladder

B. ureter

C. urethra

D. adrenal gland

4. Which of the following is part of both the respiratory and G-I systems?

A. nasal cavity

B. trachea

C. tibia

D. pharynx

5. Another name of the "thigh bone" is the

A. fibula

B. femur

C. humerus

D. pelvis

6. Which of the following does the "axial" (principle supportive structure of the body) skeleton include?

1. vertebrae	A. 1, 2 and 3 are correct
2. sternum	B. 1 and 3 are correct
3. ribs	C. 4 only is correct
4. phalanges	D. All are correct

7. Which of the following is the largest gland of the body?

A. pancreas
B. duodenum
C. thymus
D. liver

8. Which of the following helps to protect the lungs from injury, e.g. from a blow to the chest?

A. vertebrae
B. bronchi
C. parathyroid
D. ribs

9. Which of the following helps to protect the heart from injury, e.g. from a blow to the chest?

A. sternum
B. clavicle
C. humerus
D. scapula

10. Which of the following is **not** a part of the endocrine system?

A. adrenal
B. pancreas
C. pituitary
D. ureter

11. Which of the following is the major cause of death in the United States today?

A. stroke
B. cancer
C. heart disease
D. pneumonia

12. A synonym (another name) for the "voice box" is the

A. bronchus
B. trachea
C. esophagus
D. larynx

13. The major artery located in the thigh (upper leg) is the

A. fibular artery

B. aortic artery

C. femoral artery

D. carotid artery

14. Which of the following is **not** found in women of child-bearing age?

A. prostate

B. Fallopian tube

C. ovary (s)

D. anus

15. Which of the following is not associated with the skin?

A. vitamin A (manufacture of)

B. alveoli

C. pigment, e.g. melanin

D. dermis

16. The male organ comparable to the ovary is the

A. prostate

B. testis

C. pancreas

D. parathyroid

17. If the pancreas were destroyed, one would expect which of the following to be decreased?

A. thyroxin

B. growth hormone

C. calcium metabolism

D. insulin

18. When the plasma portion of blood leaves the blood vessels and picks up debris, e.g. from an infection, this liquid is now called

A. lymph

B. spinal fluid

C. peritoneal fluid

D. urine

19. A major function of the cardiovascular system is to supply cells with nutrients and

A. carbon dioxide

B. oxygen

C. ammonia

D. potassium supplement

20. The units that usually make up organs are

A. cells

B. systems

C. tissues

D. electrons

Answers

1. D
2. B
3. C
4. D
5. B
6. A
7. D
8. D
9. A
10. D
11. C
12. D
13. C
14. A
15. B
16. B
17. D
18. A
19. B
20. C

Worksheet #2
Body Systems

For each of these items, select the one best answer.

T. F. 1. The right side of the heart receives **unoxygenated** blood.
T. F. 2. It is the **arteries** that carry blood away from the heart.
T. F. 3. The exchange of 0_2 and CO_2 occurs in the **bronchi** of the lungs.
T. F. 4. The condition of **painful** urination is called **anuria**.
T. F. 5. The **adrenal glands** are part of the G-I system.
T. F. 6. Muscles cause movement by **pulling** rather than pushing.
T. F. 7. The major chemical constituent of bone is **calcium**.
T. F. 8. The **basic** living structure of humans is the cell.
T. F. 9. The kidneys and prostate make up the **reproductive** system.
T. F. 10. Bones, cartilage and joints comprise the **skeletal** system.

Answers

1. T
2. T
3. F
4. F
5. F
6. T
7. T
8. T
9. F
10. T

Part 2: Drug Classification

Introduction

When a medicine is considered the "drug of choice," it is the one that is the most likely to produce the effects most desired in that particular treatment situation. This **selection**—the

- best drug in the
- right dose for the
- right person at the
- right time

is the first step in the successful use of drugs. This decision cannot by made with 100% assurance that the interactions of drug, resident, and disease will be exactly as intended or predicted. When any one takes a drug, he or she is actually participating in an experiment under a physician's supervision. While the doctor's knowledge of the person's condition and the actions of the drug make it possible to predict the probable and desirable course, the full consequences can never be foreseen. There is always an inescapable component of uncertainty. Why is this so?

Consider these observations:

1. All drugs have multiple actions—there is no such thing as a drug with a single action. In actual use, the drug is selected because of its **principle action**—that particular one of its several effects which is wanted and intended. At the same time, its other actions, known as **side effects** will occur. Some of these are trivial and unimportant (e.g., discolored urine), others more significant (e.g., sleepiness), while still others are more critical (e.g., mental confusion).

2. **Lack of predictability** in drug-action is also related to the user. All users experience multiple responses, some of which may not readily be observable. The body's reaction to a drug varies from person-to-person and within the same person over time.

3. **The elderly** often suffer from impairment of vital body functions, and a new, acute, illness may be superimposed on a state of chronic illness or general deterioration.' (Dr. James Long, **The Essential Guide to Prescription Drugs,** Harper & Row, 1977).

It is therefore difficult to predict either the favorable or the unfavorable consequences of drug action in such situations. This is one reason why coverage by licensed nurses is often heavier in skilled nursing homes than in intermediate care homes.

Side Effects and Adverse Reactions—A Review

1. **Side-effect**—an expected and predictable action of the drug that accompanies its principal, intended, action.

Example: When Benadryl is given for hayfever, its principal action is to dry the nasal linings. Drowsiness is a side-effect. When Benadryl is given for insomnia, its principal action is to induce sleep. Nasal dryness is a side-effect.

Many side-effects are transient, disappearing as the body adjusts to the use of the drug. Many times, the intensity of these effects can be reduced by adjusting the dosage or schedule, or by substituting another drug.

2. **Adverse reaction**—an unusual, unexpected, and infrequent response that is clearly undesirable, and potentially harmful. Adverse reactions do occur, even when the drug is being used entirely properly. Most adverse reactions are unpredictable; some can be prevented.

Dr. James Long, quoted earlier, concludes that:

-Considered in the context of national drug consumption, serious adverse reactions are relatively uncommon.

-The majority of life threatening drug reactions occur in people who are already severely ill with advanced or known fatal disease.

-Most serious adverse reactions are caused by a small number of drugs which are quite hazardous by nature.

-The number of deaths properly attributed to drugs is quite small in relation to the number of lives saved by these same drugs.

—The reported high incidence of drug-induced illness and death reflects primarily the magnitude and extent of drug use rather than the inherent toxicity of drugs in general.

The above view is optimistic. However, persons about to participate in a regimen of drug therapy (either as a receiver or a giver) may be apprehensive about the chances of an unfavorable drug response occuring. By now, one should be aware of dual needs: the **benefit** to be obtained from use of the proper drug, and the **protection** needed through appropriate safeguards. Two safeguards are: adequate knowledge and effective supervision. This course will assist one to become knowledgeable; the nursing supervisor is obligated to provide effective supervision.

Preventing Adverse Drug Reactions

Some adverse drug reactions can be prevented. Dr. Long groups **shared responsibilities** to preventing adverse reactions as follows:

1. **Previous adverse reaction to a drug**
Any adverse reaction to **any** previously taken drug increases the probability of adverse reactions occurring with any subsequent drug use, even though the drugs are unrelated.

2. **Allergies**
Persons who have allergies (hayfever, asthma, eczema, hives) are more likely to develop allergies to drugs than are non-allergic individuals.

3. **Contraindications**
a. **Absolute** contraindications include those conditions that prohibit using a drug for **any** reason.

b. **Relative** contraindications advise the physician to proceed cautiously. Such situations require adjustment of dosage, additional supportive measures, and close monitoring.

4. **Precautions in Use**
All special precautions (e.g., non-use in pregnancy, exposure to sun) must be observed.

5. **Dosage**
The prescribed dosage must be followed. The physician is the only one who may adjust the regimen.

6. **Interactions**
All workers must be informed regarding all likely drug interactions. The facility's pharmacist works with a physician in adjusting the regimen to prevent adverse drug-drug, or even drug-food interactions. **You** play a crucial role in reporting suspicious changes in the resident's condition.

7. **Warning Symptoms**
Many drugs produce early symptoms that actually serve as warnings to adverse effects that may ensue. One example is severe headaches and visual changes that have been noted before the onset of a stroke in women taking oral contraceptives. Once recognized, such warning symptoms can be reported to a physician **before** harm occurs.

8. **Monitoring Examinations**
Certain drugs, especially when used over a long period of time, are capable of damaging vital body tissues such as liver, kidneys, eyes and bone marrow. A physician should closely monitor any individuals receiving those drugs through regular examinations.

9. **Advanced Age and Debility**
With age, the body loses some of its abilities to cope; in short, it becomes less efficient. Therefore, older persons, or those with debilitating diseases, often require **smaller** doses at longer intervals. THE EFFECTS OF DRUGS ON THE ELDERLY AND SEVERELY ILL ARE OFTEN UNPREDICTABLE.

10. **Use of Many Drugs**
Polypharmacy, a term coined recently, refers to the tendency to take many drugs for the same complaint. That is, a person may visit two or more physicians for the same condition, and obtain a variety of medications for that condition. The greater the number of drugs in use, the greater the chance of adverse reactions.

Use of the Drug Charts

When one administers a medicine to a resident, the person giving the drug has the obligation to know the drug's
-category (e.g. analgesic)
-purpose for use (e.g. for pain)
-common side-effects (e.g. nausea)
-adverse reactions (e.g. tarry stools)
-warnings (use with caution in persons who have bleeding tendencies)
-special considerations (above)
-range of dosage (e.g. tablets—3.5 to 6.0 gm/day in divided doses)

The charts will help you by serving as a reference. But they do not include all available information, so the access to a comprehensive information source (a medications reference) remains necessary. Consider the chart on the next page. It will assist you to view "memory work" versus "looking it up". Just like various problems in arithmetic, there are cases (A) where you **must** know the answer, "Off the top of your head". Other problems, (B), are solved by knowing a memory aid or shortcut, such as can be used to solve the multiplication of any number by 11. Finally, there are very complex problems, (C), where memory fails and a process must be used to solve the problem.

Comparison of Math and Drug Knowledge

Levels of Memorization Required

	A	B	C
Math Problem:	14 x 2	38,939 x 11	38,939 x 8,527
Drug Analogy to the Math Problem:	drugs administered routinely	drugs frequently administered	drugs rarely administered
Level of Memorization Required:	High	Medium	Low
Information Obtained by:	rote memory	memory aides	problem solving process
Examples:	memorize this information for individual medications used routinely. -purpose -side-effects -adverse reactions -special considerations	medication classifications (e.g. hypnotic, anticonvulsants) are used as aides. Information is memorized for classes or categories. If a drug is known to be in a certain category, it will behave similarly to others in that same category.	all **unfamiliar** medications must be looked up in reference source before administering.

Drug Classification
Dealing with Drug Reactions

All persons who handle medications should be familiar with the general guidelines that follow, as well as with facility policies and procedures that indicate the persons responsible for the actions mentioned below.

1. The patient's response to drug therapy should be evaluated, documented and brought to the attention of the physician and pharmacist. The most critical responses are obviously adverse reactions, although favorable responses should also be reported.

2. Life-threatening responses call for discontinuing a drug immediately and notifying the nurse **at once**.

3. Health care personnel should know which drugs may cause severe reactions and require heroic treatment, and should be ready to respond to such emergencies. Emergency treatment, as in an anaphylactic reaction, includes maintenance of respiration by adequate air exchange, support of cardiovascular function, and definitive treatment of serious physiological problems. Providing this emergency treatment is generally not the nursing assistant's responsibility.

(Source: *Giving medication correctly and safely,* Bartilucci, et. al., Medical Economics Book Division, 1976.)

Medication Classifications

Drug Category	Usual Use	Common Side Effects	Example	Usual Dosage	Dosage Forms/Misc	Special Considerations
ANALGESIC Group: non-narcotic Salicylates	-Pain -Fever -Inflammation Also used for: -Transient ischemic attacks -Thromboembolism -Rheumatic fever	-Heartburn (The following should be reported immediately) -Gastro-intestinal irritation -Nausea -Vomiting -Stomach pain -Gastro-intestinal bleeding or ulceration -Bloody or black tarry stools -Severe stomach pain -Vomiting of blood -Unusual weakness or tiredness -Allergic reaction -Rash -Hives -Itching -Shortness of breath -Wheezing	aspirin, various brands	ADULT Analgesic/Antipyretic -325 to 650 mg or 5-10 gr.q4h PRN Antirheumatic (anti-inflammatory) -3.6 to 5.4 gms a day in divided doses CHILDREN Up to 2 years - dose not established 2-4 - 160 mg q 4h 4-6 - 240 mg q 4h 6-9 - 320 mg q 4h 9-11 - 400 mg q 4h 11-12-480 mg q 4h	Tablets Capsules Enteric coated tablets Suppository	Use with caution in persons who have any bleeding tendencies or are on anticoagulents. Report any signs of bleeding at once Excessive or overdosage -Dizziness -Ringing in ears -Diarrhea -Drowsiness -Confusion -Sweating -Rapid breathing
Group: Non-narcotic Acetaminophen	-Pain -Fever	(The following should be reported immediately -Urinary problems -Bloody/cloudy urine -Painful urination -Urinary frequency -Allergic reaction -Rash -Hives -Itching Blood dyscrasias -Unexplained sore throat -Fever -Unusual bleeding -Bruising -Unusual weakness or tiredness	Tylenol Datril Various Generic brands	ADULT 325 mg to 650 mg or 5-10 gr q 4 hr Limitations: Maximum 4 gms on chronic basis CHILDREN Infants up to 3 mos. 40 mg q 4-6h 4-12 months 80 mg q 4-6h 1-2 years 120 mg q 4-6h 2-4 years 160 mg q 4-6h 4-6 years 240 mg q 4-6h 6-9 years 320 mg q 4-6h 9-11 years 400 mg q 4-6h 11-12 years 480 mg q 4-6h Limitations: 5 doses a day usually	Tablets Capsules Elixir Oral solution and suspension Syrup Suppositories	

Non-narcotic Group: Non-steroidal Anti-inflammatory drugs (NSAID)	-Pain -Fever -Inflammation -Dysmenorrhea	-Heartburn -Gastrointestinal irritation -Dizziness -Drowsiness	ibuprofen motrin	ADULT 200-600 mg 3-6Xday Maximum: up to 2.4 gm daily (some practitioners go up to 3.6 gms daily) CHILDREN Not established	Tablets	Patient allergic to aspirin may be allergic to ibuprofen (true for all N6HID) Give with food or antacids to reduce gastrointestinal irritation
Narcotic	-Pain	Allergic reaction: -Hives -Itching -Rash -Troubled breathing Hypotension -Dizziness -Lightheadedness -Drowsiness -Nausea/Vomiting	propoxyphene (Darvon)	ADULT Capsule - 65 mg every 4 h as needed Maximum 390 mg daily Tablet (Darvon-N) 100 mg 4h CHILDREN Not established	capsule (Hydrochloric) Suspension Napsylate Tablet	Darvon-Schedule IV
			(Demerol)	ADULT 50-150 mg q 3-4 hr PRN		Demerol-Schedule II
ANTACIDS	-Heartburn -Gastric and duodenal ulcers	-Edema, swelling of legs/ankles -Difficult or painful urination -Constipation or diarrhea -Nausea/Vomiting	aluminum/ magnesium hydroxide	ADULT 1-4 tablets qid or 5 to 20 ml qid 20 minutes to 1 hour after meals and bedtime CHILDREN Up to 6 years old: dosage individualized by physician 6 and over: 5 to 10 ml qid	Tablets Suspension	Can affect absorption of certain drugs (including antibiotics). Certain suspensions should be avoided in sodium restricted diets
			Milk of Magnesia (see laxatives)			
ANTIANXIETY	Treatment of -Anxiety -Insomnia -Convulsions -Muscle spasms -Alcohol withdrawal	-Clumsiness or unsteadiness -Dizziness of lightheadedness -Drowsiness (daytime) -Slurred speech -Unusual tiredness or weakness -Hallucination -Mental confusion	diazepam (Valium)	ADULT 2-10 mg 2-4 X day CHILDREN 1-2.5 mg/Kg 3-4Xday	Capsules (extended release) Tablets Injection	Alcohol may potentiate Warn against activities that require alertness or good coordination with CNS until response with drug is determined. Schedule IV.

Medication Classifications

Drug Category	Usual Use	Common Side Effects	Example	Usual Dosage	Dosage Forms/Misc	Special Considerations
ANTI-ASTHMATIC (prophylactic) CROMOLYN	Prophylactic adjunct in the treatment of asthma	-Cough -Hoarseness -Dryness of the mouth -Throat irritation -Watering of the eyes Less common: -Difficult urination -Dizziness -Headache -Nausea -Vomiting -Difficult breathing	Intal	ADULT 1 capsule (20 mg) 4 times a day at regulat intervals; maximum of 8 capsules a day. CHILDREN Not recommended for children up to 5 years of age; for children of 5 and over use adult dosages.	Capsule	Do not swallow capsules. Use special spinhaler. Read instructions for use that accompany the spinhaler.
ANTIBACTERIAL	For prophylaxis For infections	Allergic reaction: -Hives -Itching -Rash -Wheezing G.I. symptoms -Nausea/vomiting -Cramps -Diarrhea	ampicillin	ADULT 250-500mg q 6h Usual maximum: 6 gm. daily CHILDREN 12.5-25 mg/Kg q 6h usual adult dose in children over 20 Kg.	Capsule Suspension	Avoid use in person allergic to penicillin. Administer on an empty stomach.
			cephalexin (Keflex)	ADULT 250-500 mg q 6h Usual maximum: 4 gms daily	Capsule Suspension	Avoid in persons allergic to penicillin May take without regard to meals.
			erythromycin (also used to treat acne)	ADULT 250 mg q 6h Usual maximum 4 gm. daily	Capsule Tablet Enteric coated	Administer on an empty stomach unless enteric coated.
			tetracycline (also used to treat acne)	ADULT 250-500 mg q 6h Usual maximum: 4 gm per day	Capsule Tablet Suspension	Administer on an empty stomach. Do not take with milk or antacids May cause increased sensitivity to light.
			sulfamethoxazole/trimethoprim (Bactrim, Septra) Usually used for urinary infections	ADULT 400 mg sulfamethoxazole 160 mg trimethoprim (1-2 above doses q 12 hours) Up to 3.2 gm sulfa per day or 640 mg trimethoprim/day	Tablet Injection Suspension	May cause increased sensitivity to light. take with large amounts of fluids

ANTIBACTERIAL Opthalmic			Sulfisoxazole Diolamine Opthalmic Susp. (Gantrisin)	ADULT Ointment topical to the conjunctiva, a thin strip (approx. 1.25 to 2.5 cm) every 8-24 hours and at bedtime. Solution: one drop to the conjunctiva every 8 hours (may be more frequently, esp. at beginning of therapy) CHILDREN Same as adult	Solution Ointment	Avoid in persons allergic to sulfonmides.
Adrenocorticoid Otic	Ear infections	-Allergic reaction: -Itching -Rash -Swelling or other signs of irritation not present before therapy	Neomycin Polymyxin B Hydrocortisone (Cortisporin Otic)	ADULT & CHILDREN Topical, to the ear canal, as a solution or suspension up to 3 drops every 6-8 hours.	Solution Suspension	Suspension should be used when the eardrum is perforated because the solution will cause pain. A cotton wick may be placed in the ear canal and then saturated with the suspension. If this method is ordered then the wick should be kept moist by adding suspension every 4-8 hours and it should be replaced at least once daily. Therapy should not be continued for more than 10 days.
ANTICOAGULANT	To prevent clots and to thin blood	Allergic reactions: -Hives -Dermatitis	warfarin (Coumadin)	2-10 mg daily as indicated by prothrombin time	Tablets	Hemorrhage may occur Subject to many drug interactions Avoid aspirin; changes in drug therapy. Prothrombin time q 30 days recommended

BEST COPY AVAILABLE

Medication Classifications

Drug Category	Usual Use	Common Side Effects	Example	Usual Dosage	Dosage Forms/Misc	Special Considerations
ANTICONVULSANT	To prevent and/ or stop seizures	Allergy (skin rash) -Hives -Itching Indications of unusual sensitivity	phenytoin (Dilantin) formerly named diphenylhydantoin (DPH)	ADULT 100 mg p.o. tid Usual limitation: Up to 600 mg a day.	Capsules Tablets (chewable) Oral suspension Injection	Take with meals to minimize gastric distress. (Should be shaken well)
		-Drowsiness -Nausea/vomiting -Constipation/diarrhea -Dizziness -Respiration depression: -Shortness of breath or troubled breating -Hangover -Unsteadiness -Headache		CHILDREN 5 mg per Kg a day, divided into 2 or 3 doses, the dosage then being adjusted as needed and tolerated but not to exceed 300 mg a day.		Do not discontinue abruptly. Warn person to avoid activities that require alertness and good coordination until CNS response to drug is determined.
		Gingival hyperplasia -good oral hygiene very important to prevent gum disease (bleeding, swollen, tender)				Overdose: (More common with phenytoin) -Continuous back & forth and/or rolling eye movement -Double vision -Hallucination -Mental confusion -Slurred speech -Staggering
			phenobarbitol (Luminal) hangover effect possible also hypnotic	ADULT 100 to 200 mg/day in a single or divided doses CHILDREN 3-5 mg/Kg/day in a single or divided doses	Capsules Elixir solutions Tablets Elixir Injection	Schedule IV
			carbamazepine (Tegretol)	ADULT 200-1200 mg/day CHILDREN Up to 6 years - 5-20 mg/Kg/day 6-12 yrs: 200-800 mg/day Usual maximum: 1 gm/day	Tablets	Notify charge nurse immediately if fever, sore throat mouth ulcers or easy bruising occurs.

ANTIDEPRESSANT Group: Tricyclic antidepressant	Treatment of depression	Anticholenergic effects -Drowsiness -Dry mouth -Blurred vision -Constipation -Urinary difficulty -Dizziness -Fainting -Fever -Sore throat	amitriptyline (Elavil)	ADULT 25 mg 2-4 X day up to 300 mg day CHILDREN Not established	Tablets Injection	Alcohol may potentiate Warn against activities that require alertness or good coordination with CNS until response with drug is determined
ANTIDIABETIC AGENT Oral hypoglycemic	Treatment and control of mild, uncomplicated diabetes	-Diarrhea -Headache -Heartburn -Nausea/vomiting	tolbutamide (Orinase)	ADULT 500 mg 1-2 X day up to 3 gms maximum CHILDREN Not effective	Tablet	The use of alcohol should be avoided. It can create a severe reaction. -Flushing -Cramps -Nausea -Vomiting Take with meals to minimize gastric distress.
ANTI-DIARRHEAL	Adjunct in the treatment of diarrhea	-Blurred vision -Dry mouth -Flushing -Dizziness	Diphenoxylate and Atropine (Lomotil)	ADULT 2.5 - 5 mg 3-4 times a day CHILDREN Not recommended in children under 12 years of age	Tablets	Avoid in patients that have problems with anticholenergics (i.e. Atropine)
ANTIFUNGAL Group: Miconazole (vaginal)	Local treatment of vulvovaginal candidiasis (form of fungus)	-Vaginal burning -Itching -Irritation not present before therapy -Allergic reactions (rash or hives)	Monistat	ADULT & CHILDREN Cream-intravaginal, one applicatorful once a day at bedtime for 7 days Suppositories-intravaginal, one suppository (100 mg) once a day at bedtime for 7 days.	Vaginal cream Vaginal suppository	None

BEST COPY AVAILABLE

Medication Classifications

Drug Category	Usual Use	Common Side Effects	Example	Usual Dosage	Dosage Forms/Misc	Special Considerations
ANTIHISTAMINE	To treat allergic symptoms	-Drowsiness -Urinary retention -Confusion -Dryness of mouth -Unusual fast heartbeat Less common -Nightmares, unusual excitement -Convulsions	diphenhydramine (Benadryl) -sedative -anticholenergic -antitussive	ADULT 25-50 mg 1-4 X day Usual maximum: 400 mg/day CHILDREN 1.25 mg/Kg 4 X day Usual maximum: 300 mg a day	Capsule Elixir Syrup	Alcohol Warn against activities that require alertness or good coordination with CNS until response with drug is determined.
ANTIPARKINSONISM AGENT dopamine type	Used for treatment of Parkinson disease (not caused by drugs)	-Constipation/diarrhea -Anxiety -Dry mouth -Nightmares -Depression -Difficult urination -Fainting or severe dizziness -Irregular heart rate -Mood or mental change -Nausea/vomiting -Unusual and uncontrolled movements of the body	levodopa (L-Dopa) Also found in combination with Carbidopa (Sinemet)	ADULT Levodopa initial dose: 250 mg 2-4 X day up to 8 gm a day Carbidopa/Levodopa 10/100 or 25/100 3X day up to 200 mg carbidopa and 2 gm L-Dopa daily CHILDREN Not established	Capsules Tablets	Administer with food or milk to minimize stomach upset.
Anticholinergic type	Treatment of Parkinsonism and extra pyramidal disorders caused by drugs such as antipsychotic agents.	Drying up -Dry mouth -Urinary retention -Constipation -Decrease in sweating -Blurred vision Drowsiness Nausea/vomiting Mental changes/hallucinations		See individual agents		Geriatric patients may be more sensitive to usual adult dose. Warn against activities that require alertness or good coordination with CNS until response with drug is determined.
			benztropine (Cogentin)	ADULT 1-2 mg 2-3 X day Usual maximum: Up to 6 mg/day CHILDREN Not established	Tablets Injection	Mental alertness
			trihexphenidyl (Artane)	ADULT 10-15 mg/day CHILDREN Not established	Tablet Capsules Elixir	
			Benadryl (See antihistamine)			

ANTI-PSYCHOTIC & ANTIMANIC AGENTS	Psychosis and behavior control	Drying up -anticholenergic -Dry mouth -Blurred vision -Constipation -Urinary difficulty -Drowsiness Hypotension-orthostatic -Dizziness -Fainting Blood disorders -Fever -Sore throat -Easy bruising Skin -Allergic rash -Jaundice -Photosensitivity Extrapyramidal -Dystonia -Akethesia -Pseudoparkinsonism Tardive dyskinesia		See individual agents	Geriatric, emaciated and dibilitated patients usually require a lower initial dose which is then gradually increased as needed and tolerated. Addictive effects can occur with CNS depressants and alcohol	Alcohol Addictive effect Antacids inhibit absorption of phenothiazines. Do not give within 2 h. Warn against activities that require alertness or good coordination with CNS until response with drug is determined.
			thioridazine (Mellarile)	ADULT Initial 25-100 mg tid. Maintenance 10-200 mg 2-4 X day Limitations: 800 mg daily maximum CHILDREN Up to 2 years: dosage not established 2-12: .25 to 3mg/Kg qid (usually 10-25 mg 2-3 x d)	Tablets Oral suspension Concentrate - Each dose should be diluted just before administering.	
			chlorpromazine (Thorazine)	ADULT 20-300 mg 1-3 X day Maximum 2 grams CHILDREN Up to 6 months: no dosage established. 6 months and over: .55 mg/Kg qid (suppository - 1 mg/Kg 3-4 X d)	Tablets Capsules Syrup Injection Suppositories Spansule Concentrate	Dilute concentrate before administering
			haloperidal (Haldol)	ADULT .5 mg - 5mg 2-3 X day. Usual maximum: up to 100 mg/day CHILDREN Not established	Tablet Concentrate	

BEST COPY AVAILABLE

Medication Classifications

Drug Category	Usual Use	Common Side Effects	Example	Usual Dosage	Dosage Forms/Misc	Special Considerations
			thiothixene (Navane)	ADULT 6 to 10 mg a day in divided doses. Usual maximum: 60 mg/-day CHILDREN Not established	Capsule Concentrate Injection	
ANTI-PSYCHOTIC & ANTIMANIC AGENTS (continued)	To treat and/or prevent manic-depressive psychoses	Lithium - early in treatment -Thirst -Polyuria -Nausea -Fine tremor Toxic symptoms -Nausea/vomiting -Abdominal cramps -Diarrhea -Thirst-polyuria -Muscle weakness	Lithium Carbonate	ADULT 300-600 mg 3-4 X day up to 2.4 gm daily CHILDREN Not established	Capsule Tablet Syrup (citrate)	Administer with plenty of H_20 and p meal to minimize G.I. upset. Caution: with patients using a diuretic, may have a fine tremor. Warn against activities that require alertness or good coordination with CNS until response with drug is determined.
BRONCHO-DILATOR-ALBUTERAL INHALATION	The relief of bronchospasm in patients with reversible obstructive airway resistance (e.g. asthma)	-Nausea -Nervousness -Trembling -Unusually fast or pounding heartbeat Less frequent: -Dizziness or lightheadedness -Dryness or irritation of mouth and throat, headache, restlessness -Unusual taste in mouth -Vomiting	Ventolin, Proventil	ADULT 2 inhalations every 4 to 6 hours CHILDREN Up to 12 yrs. of age has not been established	Inhalation Aerosol	Shake well, read instructions that accompany the inhalor.
CARDIO-VASCULAR Beta-adrenergic blocking agent	Numerous, including: Angina Cardiac arrythmias Tachycardia Hypertension Migraine prophylaxis	-Hypotension: dizziness or lightheadedness -Heart rate less than 50 beats/min. -Nausea/vomiting -Diarrhea or constipation -Dry eyes, mouth and/or skin -Cold hands and feet -Numbness or tingling of fingers/toes	propranolol (Inderal)	ADULT Highly variable, depending on patient response and indication for use. 10-8 mg qid CHILDREN Not established	Tablets Injection	Do NOT disc. abruptly. Give consistently with meals.

BEST COPY AVAILABLE

Diuretic	Diuretic and antihypertensive	-Electrolyte imbalance -Dryness of mouth -Increased thirst -Irregular heart beats -Muscle cramps -Nausea/vomiting -Unusual weakness or tiredness -Weak pulse -Dizziness or lightheadedness due to hypotension -Diarrhea -Increased sensitivity to sunlight	furosemide (Lasix)	ADULT 20 to 80 mg/day orally Usual maximum: up to 600 mg/day CHILDREN Initially 2 mg/Kg daily. Usual maximum: 5 mg/Kg daily	Solution Tablet Injection	When possible, administer in A.M. Should have high-potassium diet (citrus fruits, tomatoes, bananas, dates, apricots)
Vasodilator	Used for angina (including prophylaxis) and as a vasodilator to treat other cardiovascular problems	-Orthostatic hypotension -Light-headedness, or fainting -Dizziness -Flushing of face and neck -Headache - severe or prolonged -Nausea/vomiting -Rapid pulse -Restlessness -Skin irritation (topical dosage forms)	nitroglycerin (Nitrostat) common abbreviation is NTG	ADULT Sublingual tabs: .15 to .6 mg every 5 minutes as needed for relief of anginal attack. Usual limitation: If relief is not obtained after 3 tablets are used in 15 minutes contact physician. Can use up to 10 mg daily. Extended release tablets & capsules: 1.3 to 9 mg q8-12h as needed. Ointment: 1-2 inches every 3-4 hours as needed. Usual limitation: 5 inches. Dermal Pad: One every 24 hours for prophylaxis of angina CHILDREN Not established	Sublingual tabs Oral tablets Extended release tablets Capsules Dermal Pads: Apply to clean, dry hairless skin of upper arm or body. Rotate pads. Do NOT cut pads to alter dosage Ointments: Follow administration directions supplied with ointment carefully.	Should not be used with alcoholic beverages because of additive hypotensive effects.
EXPECTORANT	To promote flow of fluid from respiratory tract	Allergic reactions	guaifenesin (Robitussin)	10 cc q 4 hours	Syrup Capsules Lozenges	Take with lots of fluids.

Medication Classifications

Drug Category	Usual Use	Common Side Effects	Example	Usual Dosage	Dosage Forms/Misc	Special Considerations
LAXATIVES Do NOT administer in the presence of abdominal pain, nausea or vomiting	A stimulant	Abdominal cramps excessive use may cause: -Nausea -Vomiting -Diarrhea	bisacodyl (Dulcolax) (Magnesium Hydroxide)	ADULT tablets: 10-15 mg per dose. Maximum daily dose: up to 30 mg daily. Suppository: 1 supp per dose (10 mg) CHILDREN tablets: children 6 and older: 5 mg/dose. Supp.: 2 and older: one 10 mg supp./dose. Under 2: one 5 mg supp./dose	Tablets Suppositories	Do not crush or chew tablets since they are enteric coated to avoid stomach cramps. Do not give within 1 hour of milk antacids including Milk of Magnesia
	Stool softener laxative		dioctyl calcium sulfosuccinate (Surfak) dioctyl sodium sulfosuccinate (Colace)	ADULT 240 mg. a day Usual maximum: 480 mg a day Give with a full glass (240cc) of water or more CHILDREN Up to 2 years 1.25 mg/Kg up to 4 X day. 2-6: 10-50 mg/day. 6-12: 50-150 mg/day	Capsule Solutions Syrup Tablets	Note: Drink increased fluids. Give liquid in milk or juice to mask bitter taste.
	Bulk forming laxative: OCCASIONALLY: an antidiarrheal when given with much less fluid.		psyllium (Metamucil)	ADULT 1-2 rounded teaspoons 1-3 X day; each dose taken in 240 ml or more of water. Follow with second glass of liquid CHILDREN 6 years and older: ½ tsp 1-3 X d, each dose to be taken in 120 ml or more of water.	Powder	Special warnings: Dosage may need to be adjusted, depending of strength of powder. Of special note, flavored preparation usually required larger doses due to smaller percent of psyllium.

BEST COPY AVAILABLE

	Saline laxative: antacid in smaller doses		Milk of Magnesia (MOM)	ADULT Laxative: 30-60 ml/dose taken with fluids, usually at H.S. Antacid: 5-15 ml up to 4 X day CHILDREN Up to 1 yr: 2.5-5 ml/dose 1-12 yrs: 7.5-30 ml/dose	Tablet Suspension This drug contains NO salt	Can affect absorption of certain drugs (incl. antibiotics) Look for warning labels
PEDICALICIDE SCABICIDE	Used to treat -Scabies -Head lice -Crab lice	-Irritation of skin -Skin rash (not present prior to treatment)	lindane (Kwell)	One application to the skin; repeat in 7 days for head lice if necessary. Follow detailed directions which accompanies the product.	Cream Lotion Shampoo	Avoid contact with eyes
POTASSIUM SUPPLEMENTS	Electrolyte replenisher	-Diarrhea -Nausea -Stomach pain -Vomiting These side effects occur more frequently when the medication is not taken with food or is not diluted.	Potassium Chloride (K-Lor Powder, Kaon Liquid and Tablet, slow-K Tablets)	ADULT Up to 100 meg of potassium daily CHILDREN Use is not recommended	Tablets Solutions Powders	Oral potassium supplements should be taken with or immediately after meals to minimize possible stomach upset or laxative action. Oral tablets should be swallowed whole. The oral solution soluable tablet, and powder forms should be completely dissolved in at least ½ glass of cold water or juice, then sipped slowly over a 5 to 10 minute period. The drug is frequently ordered by the meq of potassium. Because the various brands of potassium have different amounts of potassium per unit, the brands are not always interchangable. A change of brands should be checked by the licensed nurse.

Medication Classifications

Drug Category	Usual Use	Common Side Effects	Example	Usual Dosage	Dosage Forms/Misc	Special Considerations
SEDATIVE-HYPNOTIC	To induce sleep	-Clumsiness or unsteadiness -Dizziness or lightheadedness -Drowsiness (daytime) -Slurred speech -Unusual tiredness or weakness -Hallucination -Mental confusion	flurazepam (Dalmane)	ADULT 15 to 30 mg at hs CHILDREN Not established	Capsules	Warn against activities that require alertness or good coordination with CNS until response with drug is determined. Schedule IV
			Valium see Anti-anxiety			
			Benadryl see Antihistamine			
TOPICAL STEROID	-Dermatitis of various causes -Irritation due to insect bites, poison ivy/oak and other agents	None with short term use Skin irritation and infections can develop in chronic use	hydrocortisone (various brands)	ADULT Apply to skin 3-4 times a day CHILDREN Apply to skin 1-2 X a day	Cream Ointment Lotion	Do not bandage or wrap the treated area unless directed by physician.
			betamethasone (Valiscore)	ADULT Apply to skin 2-3 X a day CHILDREN Apply to skin once a day	Cream Ointment Gel Lotion	

BEST COPY AVAILABLE

Unit V
Worksheets

Worksheet #1

Multiple Choice Questions. Directions: For each multiple-choice question, select the one best answer.

1. A drug used to control simple diarrhea is
A. Dialog
B. Ipecac
C. Lomotil
D. Festal

2. A very common oral medication to counteract hyperglycemia (an antidiabetic) is
A. Ovral
B. Cytomel
C. Insulin
D. Orinase

3. A medication used for sedation as well as an anti-histamine is
A. Chloral hydrate
B. Sinequan
C. Meprobamate
D. Benadryl

4. "Dyskinesia" is
A. intermittent, involuntary movement of the limbs, including rigidity
B. difficulty in getting to sleep
C. painful or difficult urination
D. impairment in the sense of touch

5. A medication commonly given for dyskinesia is
A. Motrin
B. Artane
C. Keflex
D. Lasix

6. The main side effects of "Demerol" are
A. dizziness, drowsiness, skin rash
B. drowsiness, edema, skin eruptions
C. dry mouth, confusion, constipation
D. dizziness, stomach pain, hangover

7. Metamucil should be given with
A. liquids, e.g. 2 glasses of water
B. antibiotics, e.g. tetracyclines
C. food, e.g. at mealtime
D. nothing—other substances interfere with its absorption.

8. A medication used to promote blood clotting is
A. B^2
B. Vitamin K
C. Heparin
D. Reserpine

9. A medication to help induce sleep is
A. hydrocortisone
B. Haldol
C. Dalmane
D. Tylenol

10. A special consideration of lithium carbonate is
A. do not take with acidic fluids such as orange juice
B. give only as prescribed by physician
C. take with plenty of water
D. patient may act violently and speak of suicide

11. Erythromycin should be taken
A. at mealtimes
B. on an empty stomach
C. before bedtime and at 10 AM the next morning
D. prophylactically every day, by everyone, to prevent infection from occurring.

12. A drug commonly used as an anti-anxiety medication is
A. Valium
B. Demerol
C. Dilantin
D. Lithium carbonate

13. A cardiovascular drug that **cannot** be discontinued abruptly is
A. Lasix
B. Keflix
C. Ventolin
D. Inderol

Unit V Worksheets

Worksheet #1

Multiple Choice Questions. Directions: For each multiple-choice question, select the one best answer.

1. A drug used to control simple diarrhea is
A. Dialog
B. Ipecac
C. Lomotil
D. Festal

2. A very common oral medication to counteract hyperglycemia (an antidiabetic) is
A. Ovral
B. Cytomel
C. Insulin
D. Orinase

3. A medication used for sedation as well as an anti-histamine is
A. Chloral hydrate
B. Sinequan
C. Meprobamate
D. Benadryl

4. "Dyskinesia" is
A. intermittent, involuntary movement of the limbs, including rigidity
B. difficulty in getting to sleep
C. painful or difficult urination
D. impairment in the sense of touch

5. A medication commonly given for dyskinesia is
A. Motrin
B. Artane
C. Keflex
D. Lasix

6. The main side effects of "Demerol" are
A. dizziness, drowsiness, skin rash
B. drowsiness, edema, skin eruptions
C. dry mouth, confusion, constipation
D. dizziness, stomach pain, hangover

7. Metamucil should be given with
A. liquids, e.g. 2 glasses of water
B. antibiotics, e.g. tetracyclines
C. food, e.g. at mealtime
D. nothing—other substances interfere with its absorption.

8. A medication used to promote blood clotting is
A. B^2
B. Vitamin K
C. Heparin
D. Reserpine

9. A medication to help induce sleep is
A. hydrocortisone
B. Haldol
C. Dalmane
D. Tylenol

10. A special consideration of lithium carbonate is
A. do not take with acidic fluids such as orange juice
B. give only as prescribed by physician
C. take with plenty of water
D. patient may act violently and speak of suicide

11. Erythromycin should be taken
A. at mealtimes
B. on an empty stomach
C. before bedtime and at 10 AM the next morning
D. prophylactically every day, by everyone, to prevent infection from occurring.

12. A drug commonly used as an anti-anxiety medication is
A. Valium
B. Demerol
C. Dilantin
D. Lithium carbonate

13. A cardiovascular drug that **cannot** be discontinued abruptly is
A. Lasix
B. Keflix
C. Ventolin
D. Inderol

14. Which of the following is used to help treat asthma?

A. Monistat

B. Aspirin

C. Proventil

D. Keflex

Matching: For each of the trade names listed in Column I, select the letter of the Purpose for Use in Column II.

Column I	Column II
Trade Name	**Purpose for Use**
15. ______Coumadin	A. Antibiotic
16. ______Elavil	B. Potassium supplement
17. ______Ampicillin	C. Anticonvulsant
18. ______Darvon Cmpd. 65	D. Analgesic
19. ______Dilantin Sodium	E. Anticoagulant
20. ______Lasix	F. Diuretic
	G. Antidepressant

Answers

1. C
2. D
3. D
4. A
5. B
6. A
7. A
8. B
9. C
10. C
11. B
12. A
13. D
14. C
15. E
16. G
17. A
18. D
19. C
20. F

Worksheet #2

Situation A

Mr. Sundstrom, a fifty-eight year old vice-president of a bank, began having intermittent chest discomfort over the past three weeks. He finally went to his physician and was diagnosed as having angina pectoris due to atherosclerotic heart disease. Nitroglycerin was prescribed to control the chest pain.

1. Angina is commonly brought on by
A. rest
b. sudden change is position
C. physical exertion
D. severe depression

2. Nitroglycerin should be taken
A. every three to four hours during the day
B. before every meal and at bedtime
C. at the first indication of chest pain
D. only when chest pain is not relieved by rest

3. By which route is nitroglycerin usually taken?
A. Oral
B. Intravenous
C. Sublingual
D. Rectal

4. What are the side effects of nitroglycerin?
  1. headache
  2. flushing of face
  3. lowering of blood pressure
  4. Rapid pulse
A. 1, 2 and 3 are correct
B. 1 and 3 are correct
C. 4 only is correct
D. All are correct

Directions: Use your text and a drug reference to answer each of the following:

Situation B

A 39-year old woman has been admitted to a facility following a snowmobile accident. For the past week she has been taking phenylbutazone (Butazolidin).

5. This medication is usually available in which form?
A. tablet
B. suppository
C. ointment
D. syrup

6. Of the following, which diagnosis would be most probable?
A. migraine headaches
B. arthritis
C. impaired kidney function
D. menstrual irregularities

7. After observing this woman for three days, a TMA notices that her feet are swollen and that her urine output has decreased; also, she has numerous bruises. Which of the following is the best conclusion and action one should follow?

A. She has not been drinking enough juice, double the volume of juice given per day.

B. She is not getting enough of the medication; ask the physician if he would be willing to increase the dose.

C. Administer a diuretic to reduce the swelling.

D. Recognize this as a side-effect; reassure the resident; report your observations.

E. Recognize this as a serious adverse effect; withhold all her medications and check with the consulting nurse.

8. This medication is one that is primarily a/an
A. analgesic
B. diuretic
C. anticoagulant
D. anti-fungal

9. While in the lobby visiting with her family, this patient complains of a severe headache, She asks for an aspirin. One should

A. take her temperature; if it is above 98.6°F, give her 2 tablets. Document this.

B. give her 10 grains of ASA. Report this to the nurse.

C. give her the aspirin, but only if it is "buffered" to avoid stomach distress. Document this.

D. not give her the aspirin. It will probably increase the effects of the Butazolidin. Report to nurse.

10. Which of the following conditions are **contraindications** for the administration of phenylbutazone (Butazolidin)?

   1. peptic ulcer
   2. heparin therapy
   3. edema
   4. chronic gout

A. 1, 2 and 3 are correct
B. 1 and 3 are correct
C. 4 only is correct
D. All are correct

Answers

1. C
2. C
3. C
4. D
5. A
6. B
7. E
8. A
9. D
10. D

Unit VI

The Administration of Medications

Part I: Written Procedures

Introduction

In this unit you will have the opportunity to use what you have already learned; learn correct procedures for administering oral, topical and rectal medications; and learn correct documentation procedures. Additionally, you will be able to practice these procedures until you are able to perform each *swiftly*, *skillfully* and *safely*. Remember these "**Three S's**": they constitute your goal for the remainder of the course.

Written Procedure for Medication Administration

The following pages contain step-by-step procedures for the administration of oral, rectal, and topical medications. If you carefully follow these steps, you will be administering medications in a safe and lawful manner.

Delivery System: Traditional and Unit Dose

The procedures put forth in this unit are based on a traditional drug delivery system which uses individually prescribed medications dispensed by the pharmacist for that particular resident. Under the traditional system a medication order is **written by the physician** on the resident's chart. As you know, a chart is the comprehensive record prepared for each resident. It includes all the pertinent information about the resident and the resident's care. (See Part 2, Unit VI.)

To **transcribe** a medication order means to transfer the physician's order to a medication card, and possibly to the kardex or the resident's care plan. (For a more complete definition, see Part 3 of this unit).

The medication card (also called a medicine ticket) is used for reference in setting up and administering medications. The medication card should be clearly printed and should contain the following information:

- Resident's room or ward
- Resident's full name
- The name of the medication ordered
- The dosage of the medication
- The hours to be administered
- The route for administration
- Any specific directions necessary for the medication administration
- The date the medication was ordered
- The date the medication should be discontinued

Your instructor will show and explain several properly completed medication cards.

The medication card remains with the medication until it has been administered. The medicine card will then be used for referral in charting the medication after it has been administered. If the medication is to be given again, the card is placed in the appropriate time slot for the next administration. When a medication order is changed or discontinued, the licensed nurse destroys the card, according to facility policy.

You should be aware that several newer drug-delivery systems are coming into use, replacing the traditional system. These newer systems are known as **Unit Dose Systems**. In such a system, the medication is individually packaged by the pharmacy or manufacturer and marked with the:

1. Time of administration.
2. Resident's name.
3. Route.
4. Strength of medication.
5. Medication name.

Your instructor will show you an example of an individually-packaged system which includes the preceding information.

Unit Dose Systems

Advantages - criteria of an effective drug distribution system

An effective drug distribution system should provide:

1. A minimum of medication error.
2. Increased drug-use control.
3. Minimal drug waste and pilferage.
4. Economy of operation.
5. Accurate and efficient billing.
6. Full utilization of the professional training and capabilities of all involved members of the health-care team.
7. Enhanced quality of patient care.

Based on the above seven criteria, the publication "Unit Dose In Your Hospital" (Abbott Laboratories, 1975) identifies these advantages in unit dose over the conventional delivery system:

1. Staff time ordering, picking-up, preparing, and pouring medications is greatly reduced.
2. Charting is more accurate and less time-consuming. Charting is done as medications are administered.
3. Medication errors are reduced.
4. Unauthorized drug use through loss and theft is sharply reduced.
5. Improved drug-use fosters improved resident care.
6. Paperwork is cut down.
7. Drug waste is decreased.
8. Drug stability and potency are increased.
9. The system is less complex.
10. Malpractice insurance rates may be reduced.

Forms of Unit Dose Systems

There are four major forms of unit dose systems:

A. **Centralized Systems**
These are the most common and probably most cost-efficient. In a centralized system, physician orders are interpreted, and then the prescribed drug doses are chosen from stock and placed in the resident drawers of the medication carts in one central pharmacy. This system is common to both hospitals and nursing homes.

B. **Decentralized Systems**
Under this system, there are one or more satellite pharmacies scattered throughout the facility, usually a hospital. Certain support operations, such as routine packaging of drugs, are carried out centrally under this system.

C. **Systems combining Centralized and Decentralized functions**
In most combination systems, some distribution activities are performed in the resident-care areas while the rest are performed centrally. Larger nursing homes might use this system.

D. **Partial Unit Dose System**
Occasionally, a unit dose system may be only partially complete, due to special circumstances of the health-care institution. Among variations sometimes found are:

a. lack of resident drug profile.

b. lack of control floor stock.

c. lack of seven-day pharmacy coverage.

Components of Unit Dose Systems

Setting up a unit dose system is well beyond the scope of this course. It is sufficient to note that there are elements common to all unit dose systems. These are:

1. Medications - oral, rectal, topical, injectable.
2. Packaging equipment.
3. Labeling equipment.
4. Storage containers for "bulk" medications.
5. Medication carts.
6. Physician's order form.
7. Pharmacy resident profile.
8. Medication administration record.
9. Other forms.

Guidelines for Administering Medications

1. Give medicines only upon written orders from the physician, or when directed by the head nurse. However, it should be noted that the head nurse does not originate the medicine order: only a physician can do this.

2. The person administering medications has the responsibility to know the medication's intended use, the purpose for which it is being given, any unfavorable reactions or side effects which might occur, any warnings or directions of a specific nature concerning the medication, and the usual dose.

3. It is the responsibility of the person administering medications to be familiar with the condition of the resident, (e.g., allergies to certain medications, ability to swallow).

4. The following steps are the important responsibilities of the nurse of the delegated unlicensed person when pouring and administering medications. That person should see that the:

a. Correct dose is measured
b. Correct medicine is poured
c. Correct resident is given the medicine
d. Medicine is given at the correct time
e. Medicine is administered by the correct channel or method
f. Medication is charted correctly

5. Do not give medicines you have not set up yourself unless the properly identified medication is received from the pharmacy in ready-to-use form.

6. Avoid distractions. Do not talk with anyone while setting up or administering medications.

7. Each medicine card must be read carefully. If not clear, refer back to the physician's order book or check with the licensed nurse. The information (i.e., resident's name, name of medication, route of administration, dosage, time ordered) must be the same as the physician's order.

8. Read the label of the medication container carefully, checking to see that the label and the medication card read exactly the same. The label on the medication container should be read three times, as follows:

a. When the container is **taken** from the resident's supply
b. When the medication is **removed** from the container
c. When the container is **returned** to the resident's supply

9. Never take medicine from an unmarked or soiled container. Have the pharmacist change the label. This is his responsibility. Report such instances.

10. Keep all containers tightly closed to prevent any changes from occurring to the medication. Any change in color, consistency, or odor of medication must be reported to the licensed nurse and the pharmacist.

11. Do not have any resident carry or administer medication to other residents.

12. When administering the medication to the resident, check the name on the medicine ticket (card) by comparing the name of the medicine ticket with the resident's name band, bed tag, asking the resident's name, or asking a third person to verify resident's identity.

13. Give the medication at the time it is ordered and remain at the resident's bedside until the medicine is taken.

14. Provide privacy to the resident during medication administration when it is indicated (e.g., rectal medications).

15. Medications which have been set up and not given to the resident for any reason (refusal, absence, etc.,) are to be discarded. Never return medications to their container.

16. While not responsible for the security of controlled substances, the unlicensed person must be aware the additional responsibilities concerned with their administration.

a. Generally speaking, all Controlled Substances to be discarded must be handled by forwarding them to the DEA. An option exists, however, whereby these substances may be destroyed in the facility providing that the following are met:

1. the destruction must be witnessed by a designated facility staff member and a licensed pharmacist; and

2. the destruction must be documented through the use of proper forms (see appendix D for a sample); and

3. the completed form must be forwarded to the DEA.

b. All administered Schedule II Controlled Substances must be recorded in a bound narcotic record book as they are administered (MHD 53).

17. Be humble. Remember, everyone makes mistakes: people who are wise learn from them. Admit any errors made; document, but do not dwell on past mistakes. Rather, make provisions so that the mistake does not happen again.

Assignment

Go back over these 17 points and discuss how resident safety is protected by the observance of each.

Safety in the Skill of Administering Oral Medications

Action	Rationale
1. Drug, dosage, time and route must be ordered by the physician.	1. Prescribing is the function of the physician.
2. Drug order must be in writing on a card which states resident, room and bed number, drug name, dosage, route and time.	2. Written documentation provides for resident safety.
3. Wash hands before preparing drugs.	3. Good aseptic technique.
4. Always use a tray, place drug with medication card.	4. Medication card must accompany drug as a means of identification.
5. Read label **3** times when preparing medications:	5. Triple-check assures accuracy in pouring.
A. Upon taking container from shelf.	
B. When pouring.	
C. When replacing container on shelf.	
6. Never give a drug unless label is present and clearly readable.	6. Prevents medication errors.
7. Do not touch pills or capsules with hands.	7. Good aseptic technique
8. Pour liquids away from label side of bottle.	8. Prevents messy, unreadable label.
9. Pour liquid meds at eye level; lowest part of meniscus is correct level.	9. Looking down at glass gives an inaccurate reading.
10. Do not pour liquid meds until ready to give.	10. May deteriorate, evaporate.
11. Do not mix oral liquid meds together.	11. One may precipitate the other; attractiveness may be spoiled; there may be unpredictable interactions.
12. Shake liquid suspensions vigorously before giving.	12. Drug settles to bottom, should be evenly distributed for correct dosage.
13. Always check patient's identaband, or other identification.	13. Patient may respond to wrong name, may be in wrong bed, etc.
14. Give only meds which you have prepared yourself.	14. YOU ARE RESPONSIBLE FOR YOUR **OWN** ACTIONS, NOT OTHER PERSON'S ACTIONS.
15. Do not leave drugs at resident's bedside.	15. Resident may store meds to take in suicide attempt, may take at wrong time; or not at all; or another resident may take.

16. Stay with resident while he takes medication.	16. May keep in cheek, be unable to swallow, hide pill, etc.
17. Chart only the meds which you give.	17. YOU ARE RESPONSIBLE FOR YOUR OWN ACTIONS.
18. Make sure that the drug form you are using can be given by the route which has been ordered.	18. May injure the resident.
19. If you make a drug error, fill out an accident report—errors can be wrong drug, wrong patient, wrong dosage, wrong time, wrong route (See part 3 of this Unit).	19. Legally, you are in a better position if you can show that you promptly recognized the error, and that you took action to remedy it—this is not a punishment.
20. Relax!	20. Tension and anxiety cause mistakes.
21. Observe the resident's response to the drug.	21. You should be aware of: A. What the physician intends to accomplish with the drug. B. Possible side effects of the drug.
22. Document achievement of desired response; any adverse responses.	22. Documentation provides for better resident care as it lets all team members know "what's happening." Additionally, it provides proof that a certain type and level of care has been rendered, and who has rendered the care.

Definition of Dose Preparation Standard

Steps for the task of preparing doses as identified by industrial engineering studies include the following:

1. Secure medication card for each medicine to be administered.
2. Arrange cards in room sequence.
3. Read name and medication on medication card.
4. Locate medicine on shelf of medicine cabinet. Count medicine to assure 24-hour supply.
5. Compare label on medicine container with label on medication card.
6. Pour prescribed amount into medicine cup, and read the label a second time.
7. Wipe rim of bottle, replace cap, read label a third time, and replace bottle in medicine cabinet.
8. Pour the capsules, tablets, and powders. Check each medication against card three times during dispensing procedure.
9. Transfer medication dispensed with dropper into medicine cup; add water, milk, or juices as prescribed.

Standard time per dose preparation is 0.021 hours. This means that the average length of time required to prepare a single dose for administration is 1.2 minutes.

(Source: "Unit Dose in Your Hospital," Abbott Laboratories, 1975).

Procedure to Administer Oral Medications

Equipment:

1. Medication tray
2. Medication card
3. Medication ordered
4. Medicine cup or medicine glass
5. Any measuring utensils necessary.

General Recommendations

1. Handle tablets and capsules in such a way that the fingers do not come in contact with them. Use the cap of the container to drop the tablet into the medicine cup. Verify that medication is not out-dated.

2. When setting up liquid medications: **READ LABEL DIRECTIONS**, and then

a. Check to see that the cap of the bottle is on securely.

b. Shake the bottle to mix its contents thoroughly if the medication is in the form of a suspension or emulsion. An alternate rotating wrist movement will insure a more thorough mixture.

c. Remove the cap and place it cap side down on the table.

d. When pouring liquid medications, hold the bottle with the label upward to avoid soiling it.

e. Pour the medication holding the medicine glass at eye level.

f. Wipe the lip of the bottle with a moist piece of clean paper towel or gauze before recapping it.

3. Many residents have a great deal of difficulty in swallowing medications, especially tablets and capsules of large sizes. The following techniques may be helpful in gaining the resident's cooperation as well as enabling the resident to take all the medications:

a. Have the resident in a sitting position. If the resident is in bed, elevate the head of the bed. It is much easier to swallow if in a sitting position.

b. If several tablets and capsules must be taken, offer them one at a time. If necessary, place them in the mouth, well back on the tongue.

c. Give sips of water after each tablet or capsule. Use drinking tube if necessary.

d. Allow resident to rest a minute or two after each tablet. This often quiets the cough reflex and enables the resident to take all the medications. **Patience** and **allowing sufficient time** for the resident to take the medicine and the water are the keynotes to success.

e. Give liquid medicine slowly (4 to 8 ml. should be given in several sips). Follow with sips of water.

f. A tablet or capsule may be swallowed fairly easily if given in a teaspoon of jelly or applesauce if these foods are permitted the resident.

g. If the resident has great difficulty in swallowing tablets or capsules, consult the licensed nurse. Many medicines in tablet or capsule form are also available in liquid form or in the form for injection. The physician will change the medication order, if he desires, after the licensed nurse has consulted him on the problem.

Procedure

1. Select card to be used for the given resident at the given hour.

2. Check the information on the medication card by comparing it to the physician's order, kardex, or the resident's care plan for the resident's name, medication ordered, route of administration, dosage and time ordered.

3. Wash hands.

4. Check the medicine listed on the medication card with the label on the medicine container. The label should be checked three times:

a. When **taken** from the resident's supply

b. When **removed** from the container

c. When **returned** to the resident's supply

5. When setting up solid forms (tablets, capsules, etc.), place the number of tablets in the lid or cap of the bottle and then into the medicine cup. If a scored tablet is to be broken, this should be done by the licensed person. Even licensed personnel will not attempt to break tablets which are not scored.

6. Place the set up medicine along with the card on the medicine tray. The medication card remains with the medication until the medication has been administered.

7. Carry the tray to the resident and place it securely on a table.

8. Identify individual resident prior to administration of medication by verifying his name, i.e., consult wristband, bed tag, ask the resident his name, or ask a third person to verify resident's identity.

9. Note any unusual reactions or symptoms prior to or following administration of any oral medication. Report to the licensed nurse immediately and then chart these observations.

10. Remain with the resident until the medication has been swallowed.*

11. Clean and replace equipment which has been used.

12. Chart the medication administered.

13. Visit the resident within one half-hour (or prescribed length of time) if the medication is being administered for any specific purpose, such as relief of pain, sleeplessness, etc., to see if the desired results have been achieved. Observe and chart these results.

***NOTE: A Sublingual Medication** is not swallowed: it is placed under the tongue, where it must be retained until it is dissolved and absorbed. Be sure that the resident understands the medication is not to be swallowed whole. If several medications are being given, give the sublingual medication last.

NOTE: A Troche or Lozenge is not be swallowed. It is to be dissolved on the tongue and is commonly used for the treatment of sore throats. The resident must be instructed that drinking of liquids is avoided when troches or lozenges are in the mouth because their effect would be destroyed by the resulting dilution and washing away of the drug agent.

Charting

Chart on resident's medication sheet. The information to be charted will include:

1. The medication given
2. The dosage given
3. The method of administration, i.e., oral or sublingual
4. The exact time administered
5. The signature of the person administering the medication

Procedure for Administration of Topical Medications

The medications discussed here will be applied to the following sites:

Skin—Ointments, lotions, liniments, aerosols, tinctures

Throat—Gargles, sprays

Eye—Drops and ointments (see separate procedure)

Ear—Drops (see separate procedure)

General Recommendations

Any topical medication which requires sterile procedure should be administered by a **licensed person**.

Any medications administered by inhalation require administration by a **licensed person**.

Equipment

1. Medication tray
2. Medication card
3. Medication ordered
4. Gauze squares, cotton balls, or any specific materials needed for local application as directed by the physician

Procedure

1. Check the information on the medication card by comparing it to the physician's order, kardex, or resident's nursing care plan for the resident's name, medication ordered, site of application, dosage, and time ordered.

2. Wash hands.

3. Place the medication ordered on the tray with the medication card in the tray slot, checking that the drug label corresponds with the medication card. The label on the medication should be checked three times:

a. When **taken** from the resident's supply

b. **Prior** to administration

c. When **returned** to the resident's supply

4. The medication card should remain with the medication until the medication has been administered.

5. The medication card should include the directions for application. If the card indicates, follow the directions on the label or those accompanying the container. **Read All Directions Carefully**. If you have any questions regarding application of the medication ordered, seek assistance from the licensed nurse.

6. Include on medication tray any materials needed for application as directed.

7. Carry the tray to the resident and place it securely on a table.

8. Identify the individual resident prior to administration of medication by verifying his name, i.e., consult wristband, bed tag, ask resident his name, or ask a third person to verify resident's identity.

9. Explain to the resident what you are going to do.

10. Position the resident according to directions.

11. Check the medication again, seeing that the label on the medication corresponds with the medication ordered on the medication card.

12. Note any significant observations or complaints concerning the affected area of the body prior to medication application and any unusual reactions or symptoms following the medication application. Report this to the licensed nurse and chart these observations.

13. Administer the medication **according to directions**. Keep the following information in mind:

a. Ointments are applied to any part of the skin by direct application, or they may be applied as a dressing by smearing a piece of gauze with the medication. If the medication must be removed from the container (jar, etc.), use a tongue blade—**Do Not Use Your Fingers**.

b. Lotions are swabbed on the skin for their antiseptic and/or astringent effects.

c. Liniments are rubbed on the skin quite vigorously to relieve soreness of the muscles and joints. The psychological effect of massage is an important factor in the application of liniments.

NOTE: When applying ointments, lotions, and liniments to infected areas, use extreme care not to aggravate the infection. Apply medication as directed. Seek assistance from the licensed nurse should some question arise.

d. Aerosols may be sprayed on the skin without touching it. This has a great advantage when the skin is irritated or burned.

e. Tinctures for local application may be applied with a cotton swab. A clean swab must be used each time additional medication is obtained from the container.

f. Gargles are solutions that are bubbled in the throat by keeping the solution in the upper throat, tilting head back, and exhaling air creating bubbling.

NOTE: Check contents of any preparation to be gargled and know whether the medication should be diluted prior to administration.

g. Sprays are used principally to treat nose and throat conditions.

14. After applying medication, leave the resident in a comfortable position.

15. Wash hands.

16. Clean and replace equipment.

17. Chart the medication administered.

18. If the medication has been applied or administered for a specific purpose (i.e., to relieve itching, to relieve pain, etc.,) visit the resident within prescribed length of time to see if the desired results have been achieved. Chart these results.

Charting

Chart on the resident's medication sheet. The information to be recorded will include:

1. The medication given
2. The dosage given
3. The area(s) of the body to which the medication was administered
4. The signature of the person administering the medication

Procedure to Administer Rectal Medications (Suppositories)

Definition: Suppositories are preparations of drugs mixed with a base such as glycerin, plain or medicated cocoa butter, or carbo-wax, made into suitable shape for insertion into the rectum. The suppository melts or dissolves at body temperature. Your instructor will provide samples.

Type and Purpose

1. **Glycerin**—To stimulate intestinal movement (called peristalsis)
2. **Astringent**—To contract tissue, to check bleeding and secretions and to relieve pain
3. **Ice**—Can be used to check bleeding or relieve local inflamation
4. **Anodyne** or Local Sedative—To limit peristalsis and to relieve pain
5. **For Systemic Effect**—When drug cannot effectively be given by mouth

Equipment

1. Medication tray
2. Medication card
3. Suppository in medicine cup on tray
4. Finger cot or rectal glove
5. Water-soluble lubricant
6. Tissue Wipes

Procedure

1. Check the information on the medication card by comparing it to the physician's orders, the kardex, or the resident's care plan for the resident's name, medication ordered, route of administration, and the time ordered.
2. Wash hands.
3. Obtain suppository from the resident's supply, checking the label on the suppository with the medication card. The label should be checked three times:
   a. When **taken** from the resident's supply
   b. When **removed** from the container
   c. When **returning** the remaining suppositories to the resident's supply
4. Place the suppository in the medication cup along with the card in the medicine tray slot. The medication card remains with the medication until the medication has been administered.
5. Carry the tray to the resident and place it securely on a table.
6. Identify individual resident prior to administration of medication by verifying his name, i.e., consult wristband, bed tag, ask resident his name, or ask a third person to verify resident's identity.
7. Screen the resident and explain what is to be done and how it is to be done.

8. Have the resident turn on side. (Preferably left side).
9. Put on rubber glove or finger cot.
10. Remove suppository from wrapper or foil.
11. Lubricate the tip of the suppository with lubricant on a tissue wipe.
12. Insert the suppository into the rectum well beyond the sphincter, pushing it in gently with your gloved forefinger. Encourage resident to relax by breathing through his mouth.
13. After slowly withdrawing your finger, press the folded tissue against the anus until the urge to expel it subsides.
14. Note any unusual reactions or symptoms following the insertion of suppository. Report this to the licensed nurse immediately and then chart your observations.
15. Remove and discard or clean finger cot or glove.
16. Wash hands.
17. Leave resident in comfortable position.
18. Clean and replace equipment.
19. Chart the medication administered.
20. If the suppository has been administered for a specific purpose, visit the resident within a half-hour to see if the desired results have been achieved. Chart these results.

Charting

Chart on resident's medication sheet. The information to be charted will include:

1. The rectal medication given
2. The dosage given
3. The method of administration, i.e., rectal
4. The exact time administered
5. The signature of the person administering the medication

Procedure for Administration of Topical Medications: Eye Drops

General Recommendation: If sterile technique is required, this procedure should be performed by a licensed nurse.

Equipment:

1. Medication tray
2. Medication card
3. Medication ordered
4. Sterile dropper if not included in bottle
5. Cotton balls

Procedure

1. Check the information on the medication card by comparing it to the physician's orders, the kardex, or the resident's care plan for the resident's name, medication ordered, route of administration, and the time ordered.

2. Wash hands.

3. Obtain the ordered eye drops from the resident's supply, checking that the label on the medication container corresponds with the medication card. The label should be checked three times:

    a. When **taken** from the resident's supply

    b. **Prior** to administration

    c. When **returned** to resident's supply

4. Place the container of eye medication on the medication tray along with the medication card in the medicine tray slot. The medication card remains with the medication until the medication has been administered.

5. If the eye medication requires but does not include a dropper, include a sterile dropper on the tray.

6. Carry the tray to the resident and place it securely on a table.

7. Identify individual resident prior to administration of medication by verifying his name, i.e., consult wristband, bed tag, ask resident his name, or ask a third person to verify resident's identity.

8. Explain to the resident what you are going to do. Have the resident sit or lie down.

9. Note any significant observations or complaints regarding the affected eye(s) prior to medication instillation and any unusual reactions or symptoms following the medication instillation. Report this to the licensed nurse immediately and then chart these observations.

10. Cleanse eye with cotton ball. Wipe from inner corner outward once. If drops are to be instilled in both eyes, use a clean cotton ball for each eye.

11. Draw up the ordered amount of medication into dropper, checking again to see that the label on the medication container reads the same as the medication card.

12. Position the resident with head back and looking upward. Separate lids by raising upper lid with forefinger and lower lid with thumb. The dropper approaches the eye from below, outside the resident's field of vision, with due

care to avoid contact with the eye. The drop is applied gently near the center of the lower lid and is not allowed to fall more than one inch before it strikes the eye.

13. Allow eyes to close gently. Ask resident to keep eyes closed for a few minutes.

14. Wipe excess medication from eye with a clean cotton ball, using separate cotton balls again for each eye.

15. Leave resident in a comfortable position.

16. Wash hands.

17. Clean and replace equipment.

18. Chart the medication administered.

19. If the drops have been instilled for a specific purpose, visit the resident within a prescribed period of time to see if the desired results have been achieved. Chart these results.

Charting

Chart on the resident's medication sheet. The information to be recorded will include:

1. The eye medication given
2. The number of drops intilled
3. The eye(s) into which the medication was instilled
4. The signature of the person administering the medication

Procedure for Administration of Topical Medications: Eye Ointment

General Recommendation: If sterile technique is required, this procedure should be performed by a licensed nurse.

Equipment:

1. Medication tray
2. Medication card
3. Medication ordered
4. Cotton balls

Procedure

1. Check the information on the medication card by comparing it to the physician's order, the kardex, or the resident's care plan for the resident's name, medication ordered, route of administration, and the time ordered.

2. Wash hands.

3. Obtain the ordered eye drops from the resident's supply, checking that the label on the medication container corresponds with the medication card. The label should be checked three times:

a. When **taken** from the resident's supply

b. **Prior** to administration

c. When **returned** to resident's supply

4. Place labeled tube of eye ointment on the medication tray along with the medication card in the medicine tray slot. The medication card remains with the medication until the medication has been administered.

5. Carry the tray to the resident and place it securely on a table.

6. Identify individual resident prior to administration of medication by verifying his name, i.e., consult wristband, bed tag, ask resident his name, or ask a third person to verify resident's identity.

7. Explain to the resident what you are going to do. Have the resident sit or lie down.

8. Cleanse eye with cotton ball. Wipe from inner corner outward once. If ointment is to be applied to both eyes, use a clean cotton ball for each eye.

9. Note any significant observations or complaints regarding the affected eye prior to medication application and any unusual reactions or symptoms following the medication application. Report this to the licensed nurse immediately and then chart these observations.

10. Remove cover from the ointment, checking again that the label on the medication corresponds with the medication ordered on the medication chart.

11. Position the resident with head back and looking upward. Retract lower lid. Approach the eye from below, outside the resident's field of vision, with due care to avoid contact with the eye. Apply the ointment in a thin layer along inside of lower lid. Break off ribbon of ointment from tube by releasing pressure and removing tube. Do not use your fingers.

12. Hold lid open few seconds.

13. Allow eyes to close gently. Ask resident to keep eyes closed for a few minutes.

14. Leave resident in a comfortable position.

15. Wash hands.

16. Clean and replace equipment.

17. Chart the medication administered.

18. If the eye ointment has been applied for a specific purpose, visit the resident within a prescribed period of time to see if the desired results have been achieved. Chart these results.

Charting

Chart on the resident's medication sheet. The information to be recorded will include:

1. The eye medication given
2. The eye(s) into which the ointment was applied
3. The signature of the person administering the medication
4. Time of administration

Procedure for Administration of Topical Medications: Ear Drops

General Recommendation: If sterile technique is required, this procedure should be performed by a licensed nurse.

Equipment:

1. Medication tray
2. Medication card
3. Medication ordered
4. Dropper if not included in bottle
5. Cotton balls

Procedure

1. Check the information on the medication card by comparing it to the physician's orders, kardex, or the resident's nursing care plan for the resident's name, medication ordered, dosage, site of instillation (ears), and the time ordered.

2. Wash hands.

3. Obtain ear medication from the resident's supply, checking that the label on the container corresponds with the medication card. The label should be checked three times:

a. When **taken** from the resident's supply

b. **Prior** to administration

c. When **returned** to resident's supply

4. Place the ear medication on the medication tray along with the medication card in the medicine tray slot. The medication card remains with the medication until the medication has been administered.

5. If the ear medication requires but does not include a dropper, include a dropper on the tray.

6. Carry the tray to the resident and place it securely on a table.

7. Identify individual resident prior to administration of medication by verifying his name, i.e., consult wristband, bed tag, ask resident his name, or ask a third person to verify resident's identity.

8. Explain to the resident what you are going to do.

9. Position the resident:

a. If lying in bed, have bed flat and turn head to opposite side.

b. If sitting in chair, tilt head sideways until ear is as horizontal as possible.

10. Clean entry to ear canal with a clean cotton ball.

11. Note any significant observations or complaints regarding the affected ear prior to medication instillation and any unusual reactions or symptoms following the medication instillation. Report this to the licensed nurse immediately and then chart these observations.

12. Draw up the medication into the dropper, checking again to see that the label on the medication container corresponds with the medication card.

13. Administer the ear drops by pulling the ear gently backward and upward and instill number of drops ordered into ear canal. Do not touch any part of the ear canal with the dropper to prevent contaminating the dropper.

14. If the resident desires a cotton ball, place a clean cotton ball loosely in the ear.

15. Have resident maintain the required position for two or three minutes

16. If drops are to be instilled in both ears, wait at least five minutes before putting drops in second ear, then repeat the procedure as instructed.

17. Leave resident in a comfortable position.

18. Wash hands.

19. Clean and replace equipment.

20. Chart the medication administered.

21. If the ear drops are administered for a specific purpose, visit the resident within a prescribed period of time to see if the desired results have been achieved. Chart these results.

Charting

Chart on the resident's medication sheet. The information to be recorded will include:

1. The ear medication given.
2. The number of drops intilled.
3. The ear(s) into which the medication was instilled.
4. The signature of the person administering the medication.
5. Time of administration.

Part II: Charting

Accurate and Lawful Charting

Objectives: The student will:

A. Correctly enter a written account of all medications not administered as ordered, including

1. Those refused by the patient
2. Those medically contraindicated

B. Demonstrate his knowledge of the correct procedure involved when an error is made in charting.

Legal Considerations

All that you have already learned and all that you will learn in this course finds its expression in a single document: The resident's chart. Each time you handle this record, remember that it is a legal summary of the occurrences and situations pertaining to the resident's care.

As you no doubt know, one function of the law is to protect those who are dependent on others from unfair, unscrupulous or inadequate treatment. When a person places himself in the hands of a health-worker, he should be able to reasonably expect that his life and other human rights will be protected from inadequate care. Lawmaking bodies have attempted to protect these rights by passing statutes and regulations which govern **who** may administer **what** services under **what** conditions and **when** this may or must be done. The course you are now taking is the result of just such legislation.

Many persons, new to the field of resident care, naturally approach the process of charting with a great deal of hesitation. However, once you have mastered the principles of charting and then apply them in a rigorous and competent manner, you should be able to provide safer and more adequate resident care.

Today, many judges are being confronted with the complex problem of ascertaining whether a resident received adequate care from competent personnel. Under law, the resident expects and is entitled to quality care. The law supports these expectations and makes the health-worker responsible for a 'duty of care', which becomes a legal duty towards the resident. If the health-worker does not meet this legal duty of 'reasonable care', and if consequently some harm does come to the resident, the health-worker may be held liable as negligent. You should be aware that negligence may be the failure to give any care, or it may be the giving of poor resident care. Your instructor will give you several examples, contrasting these errors of omission of acts vs. commission of acts. Think about them until the differences become clear to you. Traditionally, we hold the person with the most training and education to be responsible for the outcome of all actions performed by those responsible to him. Even so, this does not mean that anyone below him in the organizational hierarchy would be held blameless. It simply means that the persons with the highest level of licensure (and in many cases this may be the physician) would be ultimately responsible. But remember, **you** are still responsible for anything you do or do not do. This is why the law holds that each notation in the resident's chart must be signed by the health-worker administering the care.

The Chart: What Is It?

A medical or health record is the compilation of all pertinent facts of the patient's life history, his/her illnesses, and treatments given. Medical records are an important tool in the practice of medicine, nursing and resident care in general. They serve as a basis for planning resident care; they provide a means of communication between the physician and other workers; they furnish documentary evidence as to the course of illness and treatment; and they serve as a basis for review, study and evaluation of health care rendered.

Examine the included pages from a chart. Each health facility has charts and other forms which meet its needs. You are responsibile for using whatever types of charts and forms are currently used in your employing facility. The chart on these pages may not be familiar to you, but it contains components which are common to all charts.

The collection of informational sheets and forms relating to an individual resident is accumulated under one cover, becoming what is generally known as the resident's chart. Your instructor will show you other sample forms which comprise such a chart.

Great care must be taken to insure the chart's accuracy as it can be admitted into a court of law as evidence of the treatment and care that a resident received while at a facility. The chart must be preserved for many years. In Minnesota, nursing homes are required to keep it intact and accessible on the premises for at least ten years beyond the date of the resident's death or discharge. (MHD 48 (a)(4)). You can thus begin to appreciate the necessity of using the proper standard medical abbreviations and symbols, because in a decade a chart with your notations may be reviewed and the meaning must be clear, precise and not easily misconstrued. You are encouraged to **chart observed facts** and not inferences and judgements.

Remember that the chart is confidential in nature and its contents should neither be shown nor discussed with anyone not administering care to the resident. This includes the family. The resident, however, does have a right to know the contents of his chart, but it is generally the responsibility of the licensed person (and not yours) to make the contents known to the resident. You should also remember that accounts of the resident's condition are written and signed by the person giving the care.

The Medication Record

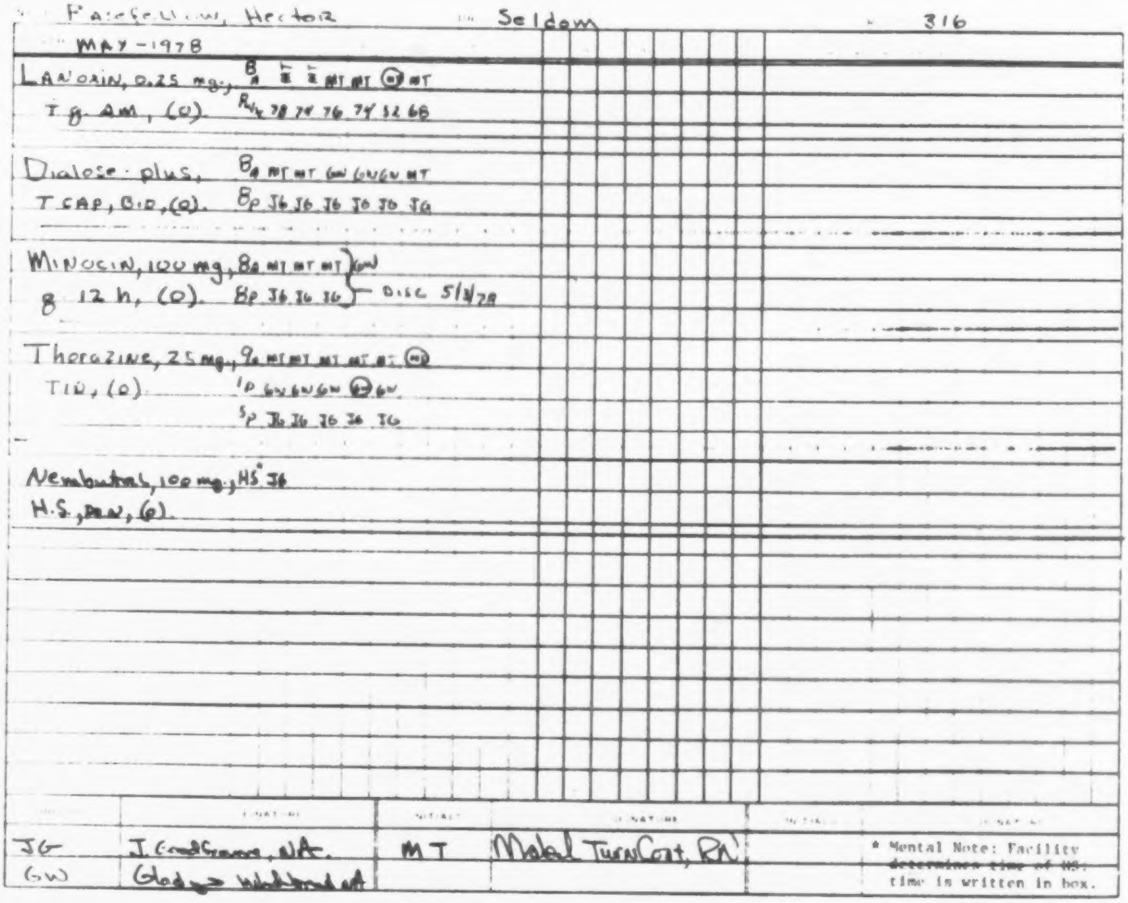
Let us now look more closely at the sample medication record contained in this unit and determine how it is made up. The column naming **medications** lists all medications which have been administered to the resident during that particular month. The listed medications are from the physician's orders and the process by which they appear there is known as 'transcribing'. (Transcribing can involve copying the physician's orders from the medical record to any other written record or committing the physician's verbal orders to writing.) You will generally not be asked to transcribe. This task is usually done by licensed personnel, or in some cases by a specially-trained ward clerk. You should also recall from Unit I that unlicensed individuals are not to accept verbal orders, including those over the telephone. (**FR**, Vol 39, #12, 405.1124 (h)).

BEST COPY AVAILABLE

The **hour** column of the medication record simply tells at what times the medications are to be administered. Unless such times are specified by the physician, each facility sets up its own schedule of administration times.

The **numbers** indicate the dates of the month and the initials indicate who administered the medication or treatment. In some cases, other information may appear below these initials. A case in point is that of lanoxin. The administration of this medication is contraindicated should the pulse fall below 60 or rise above 110. With this in mind, the licensed person always takes the pulse prior to administering medications such as lanoxin. The pulse rate is recorded to justify administration or to justify the medication being withheld. At the bottom of the medication record is space to record and compare initials and full signatures.

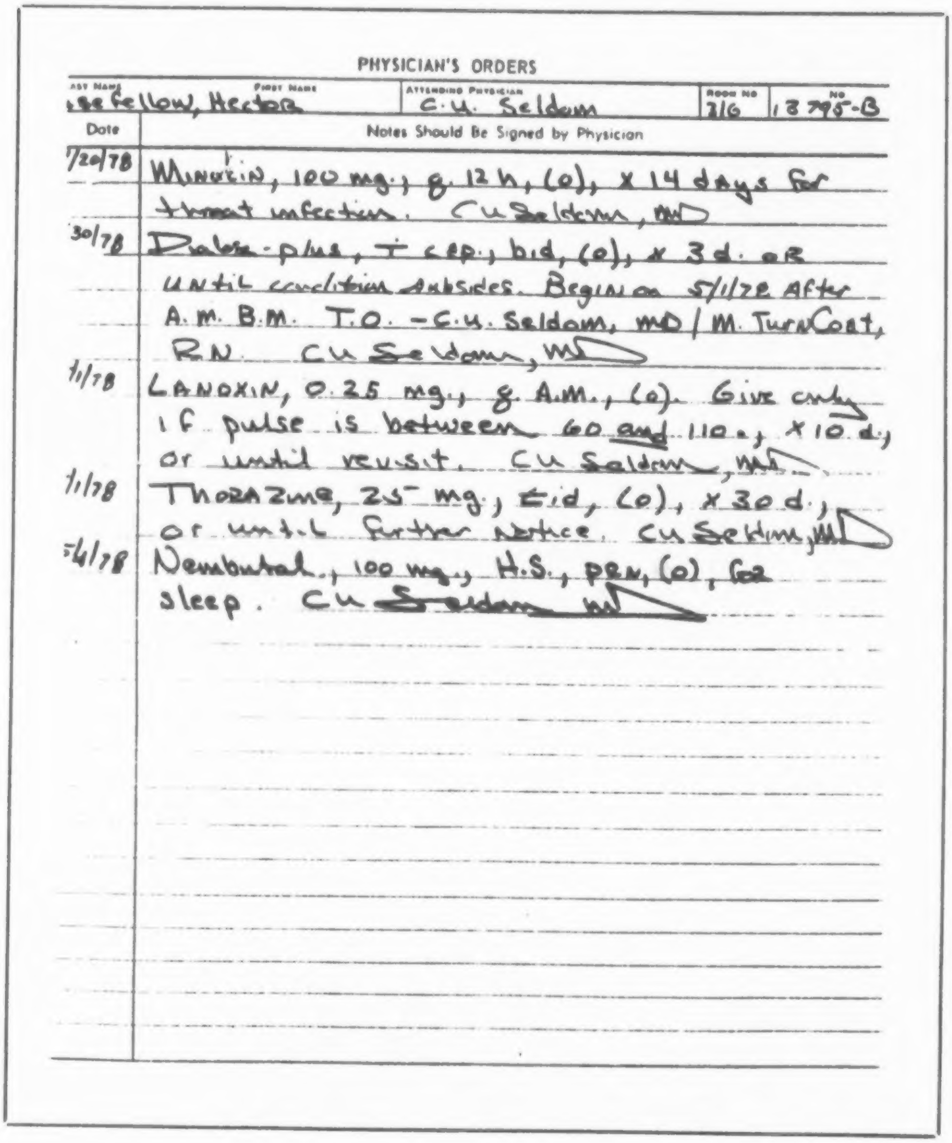
Your instructor will now give you practice in charting accurately, precisely, and completely.



Fairfellow, Hector Seldom 316
MAY - 1978
LANOXIN, 0.25 mg., 8a MT MT MT MT
T q. AM, (O). 78 74 76 74 52 68
Dialose - plus, 8a MT MT GW GW GW MT
T CAP, B.I.D., (O). 8p JG JG JG JG JG JG
Minocin, 100 mg., 8a MT MT MT } GW
q 12 h, (O). 8p JG JG JG } D.C. 5/3/78
Thorazine, 25 mg., 9a MT MT MT MT MT
TID, (O). 1p GW GW GW GW
5p JG JG JG JG JG
Nembutal, 100 mg., HS* JG
H.S., PRN, (O).

JG J. GoodGrams, NA.
GW Gladys Whitehead NA
MT Mabel TurnCoat, RN

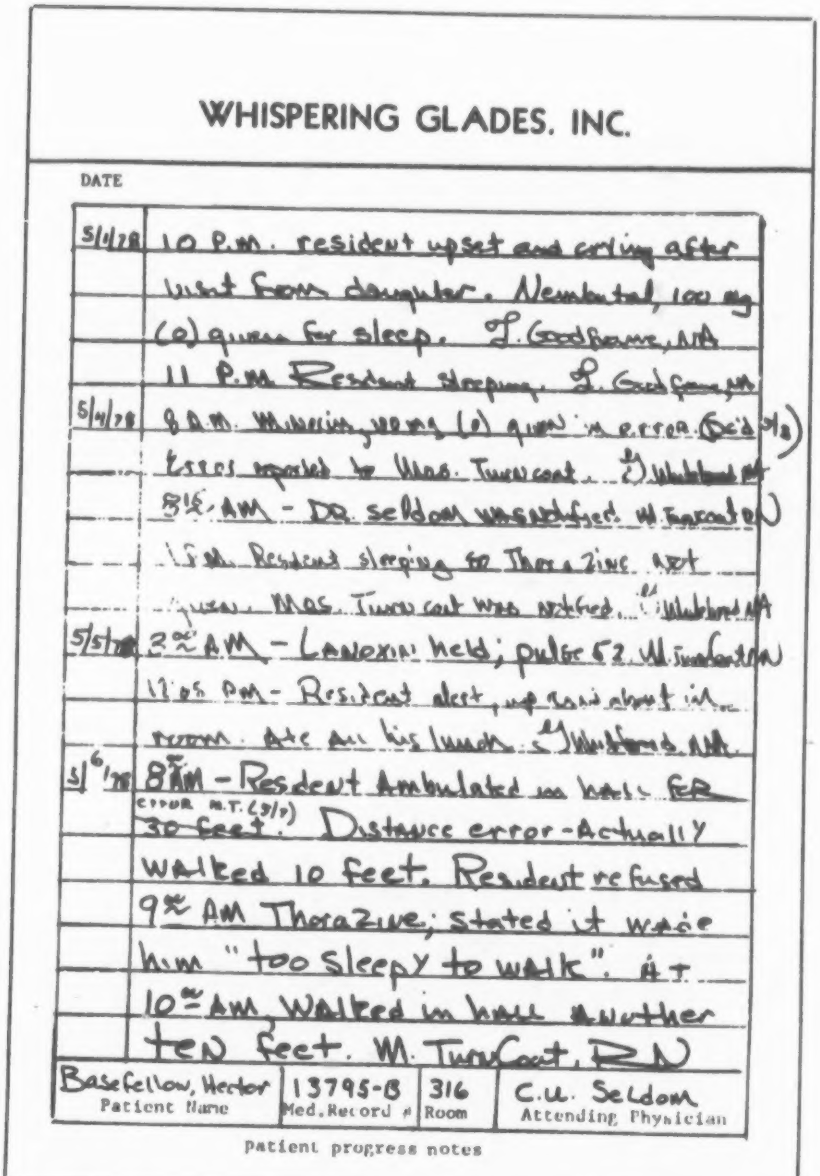
* Mental Note: Facility determines time of HS: time is written in box.



PHYSICIAN'S ORDERS

ast Name First Name	Attending Physician	Room No	No
ee fellow, HectoR	C.U. Seldom	316	13795-B

Date	Notes Should Be Signed by Physician
/20/78	MinoCin, 100 mg.; q. 12 h, (o), x 14 days for throat infection. CU Seldom, MD
30/78	Diabe-plus, i cap.; bid, (o), x 3 d. oR until condition subsides. Begin on 5/1/78 After A.M. B.M. T.O. - C.U. Seldom, MD / M. TurnCoat, RN. CU Seldom, MD
/1/78	LANOXIN, 0.25 mg., q. A.M., (o). Give only if pulse is between 60 and 110., x 10 d., or until revisit. CU Seldom, MD
/1/78	ThoRAZine, 25 mg., tid, (o), x 30 d., or until further notice. CU Seldom, MD
5/4/78	Nembutal., 100 mg., H.S., pRN, (o), foR sleep. CU Seldom MD



WHISPERING GLADES. INC.

DATE	
5/1/78	10 P.M. resident upset and crying after visit from daughter. Nembutal, 100 mg (o) given for sleep. L. Goodframe, NA
	11 P.M. Resident sleeping. L. Goodframe, NA
5/4/78	8 A.M. [illegible] mg (o) given in error. (Dc'd 5/3) Error reported to Mrs. Turncoat. [illegible] NA
	8^{15} AM - Dr. Seldom was notified. M. Turncoat RN
	1 P.M. Resident sleeping. No Thorazine was given. Mrs. Turncoat was notified. [illegible] NA
5/5/78	8^{00} AM - Lanoxin held; pulse 52. M. Turncoat RN
	12^{05} PM - Resident alert, up and about in room. Ate all his lunch. [illegible] NA
5/6/78	8^{00} AM - Resident Ambulated in hall ~~for 30 feet~~. error M.T. (5/7) Distance error - Actually walked 10 feet. Resident refused 9^{00} AM Thorazine; stated it made him "too sleepy to walk". At 10^{00} AM, walked in hall another ten feet. M. TurnCoat, RN

Basefellow, Hector	13795-B	316	C.U. Seldom
Patient Name	Med. Record #	Room	Attending Physician

patient progress notes

BEST COPY AVAILABLE

General Rules

Below are listed general rules which are applicable to charting on the forms provided. Where these rules differ from those adopted by either your instructor or institution, you should follow the latter.

1. The medication column should be completed by an authorized person. Make sure you are familiar with the medications listed, doses ordered, and abbreviations used.

2. When charting medications, chart **directly** from the medication card. This is the only way you can be sure that you are charting the correct medication given to the correct patient at the correct time by the correct route. When a medication card is not used, the chance of medication error is greater. When a medication card is used, mistakes are more easily detected. Using one will help prevent future mistakes.

3. For each medication administered by you, your initials must appear below the correct date and opposite the medication administered. (See examples).

4. Your initials and full signature must be found in the appropriate space on the bottom of each medication record sheet. Your title must be written or abbreviated following your signature.

5. Ditto marks must **not** be used.

6. Do not erase. If the chart is called into court, erasures provide reason for legal questions to be raised. If you make an error in recording, draw a line through the error and write above the lined through materials. Initial and date the "error" and if possible explain the reason for the "error". (See example).

7. Record **after** administering the medication.

8. If a medication cannot be administered as ordered due to a contraindication print your initials in the appropriate box, circle initials, and note reason for withholding in the nursing notes. Notify your nursing supervisor immediately regarding your actions and reasons for withholding the medication (See example).

9. When a medication is discontinued, write "DISC" and date after the last dose administered. (See example).

10. If the resident refused the medication, place a circle in the appropriate box, write your initials inside the circle and chart the reason for this refusal in the nursing notes. (See example).

11. Remember, that charting is not done correctly unless it contains your initials, verified with full signature and title (in the case of the medication record) or full signature and title (in the case of the nursing notes).

BEST COPY AVAILABLE

Rules of Charting— Summary

1. Writing or printing is acceptable.
2. Always use ball point pen. Never use a pencil or felt pen.
3. Always write neatly and legibly.
4. Use the correct column and appropriate line, and correct chart.
5. Use the correct spelling.
6. Do not erase — line through the error, write "error", — initial and date.
7. Always chart as soon as possible.
8. Always chart the time, date and year, the observation was made or the procedure performed.
9. Accepted abbreviations may be used, if legend available.
10. Close each entry with your signature and job classification.
11. Do not chart for another employee, unless you use 3rd person approach. (E.g., "according to . . .").
12. No blank spaces are left on the nurses' progress record. Lines are drawn to prevent illegal entry.
13. Patient or resident records are strictly confidential. The aide-patient relationship is built on trust and it is essential to hold in confidence all matters concerning the patient.
14. Avoid the use of professional jargon, and personal opinions.

Part III: Errors in Medication Administration

Reporting Errors in Medication Administration

Objectives: The student will:

A. Show that he recognizes medication administration errors by stating an example of a violation of each of the five rights.

B. Demonstrate an appropriate response to medication errors by accurately indicating what steps must be taken in response to an error.

Each nursing facility must have a written policy for the reporting of medication errors, and a form to be filled out when an error occurs (See MHD 53 (a)). Everyone who administers medications is responsible to know the policy of the facility in which they are employed.

You have made an error in administering medications if you have not observed each of the "Five-Rights", which are:

1. Right patient (resident)
2. Right time
3. Right medicine
4. Right dose
5. Right method of administration (i.e., right route)

It must be stressed that a medication error is defined as *any* violation of the five rights.

An error which occurs in setting up, passing or recording a medication must be reported immediately. An error shows a breakdown in the system and is a serious occurrence even though the effect on the resident may not be serious.

You must know the purpose and action of each medication you administer in order to know the effect of an error on the resident.

Here is an example showing a violation of each of the "five-rights". Study it carefully.

Consider the effects of an error in the order for Orinase 500 mg. b.i.d. The desired effect of Orinase is to increase the production of insulin in the body so that sugars and starches are assimilated. A consistent level of the drug must be maintained for optimum effectiveness.

Consider the consequences of an Orinase administration error involving the:

Wrong Patient
This error involves two people. The patient who did not receive the medication would be deprived of the desired effect and the patient who received the medication without an order would be receiving a potentially dangerous drug. The effect of this drug on a non-diabetic resident can be detrimental.

Wrong Time
In order to maintain a consistent level of effectiveness, Orinase should be given at regular intervals, usually daily.

Wrong Medication
Again, the resident would be deprived of the desired effect of the prescribed Orinase and would be receiving an unprescribed drug, the actions of which would have to be determined.

Wrong Dosage
The dosage of Orinase is carefully calculated by the physician and adjusted to each resident's needs. Too little would not be effective. Too much could lower the blood sugar below desired levels.

Wrong Route
A nursing assistant will not be giving injectable medications. If Orinase is ordered to be given orally and an injection of insulin is given by mistake, the lowering of the blood sugar would occur much more rapidly and could be dangerous.

What To Do When An Error Occurs

A. The charge nurse must be notified immediately when an error occurs. If the charge nurse is not on duty, she *must* be called at home. The charge nurse will give instructions for the immediate care of the resident and will call the physician if this is necessary.

B. The medication error report form is filled out. All questions must be answered completely. The form is signed by the person making the error, the charge nurse and the director of nursing. Examine the included medication error report form. The error made and charted involves giving a dose of minocin after the medication had been discontinued.

C. Record in the resident's chart exactly what happened, what was done and how the resident was affected. There must be follow-up charting which reflects any long-term effects.

D. If more than one resident is involved in the error, there must be charting on each involved resident's chart.

E. Sign all entries.

Assignment

On the next two pages you will find sample error report forms. The first of these is blank, and could be duplicated either for class or facility use. The second is completed and reflects a medication error made in Part 2, "Charting". Study the completed form carefully. Your instructor will provide practice in completing this or a similar form. If your facility uses a different form, be sure your instructor is aware of that fact.

MEDICATION ERROR REPORT - SAMPLE

DATE OF ERROR ______________ TIME OF ERROR ______________

NAME OF PERSON INVOLVED IN ERROR

RESIDENT ______________

EMPLOYEE ______________

TYPE OF ERROR

INCORRECT TIME ______________

INCORRECT MEDICATION ______________

INCORRECT DOSAGE ______________

INCORRECT ROUTE OF ADMINISTRATION ______________

INCORRECT PATIENT RECEIVED MEDICATION ______________

DESCRIPTION OF ERROR IN DETAIL ______________

____

____

____

HOW COULD THIS ERROR HAVE BEEN PREVENTED? ______________

____

____

____

PERSON WHO DISCOVERED ERROR

EMPLOYEE ______________

RESIDENT ______________

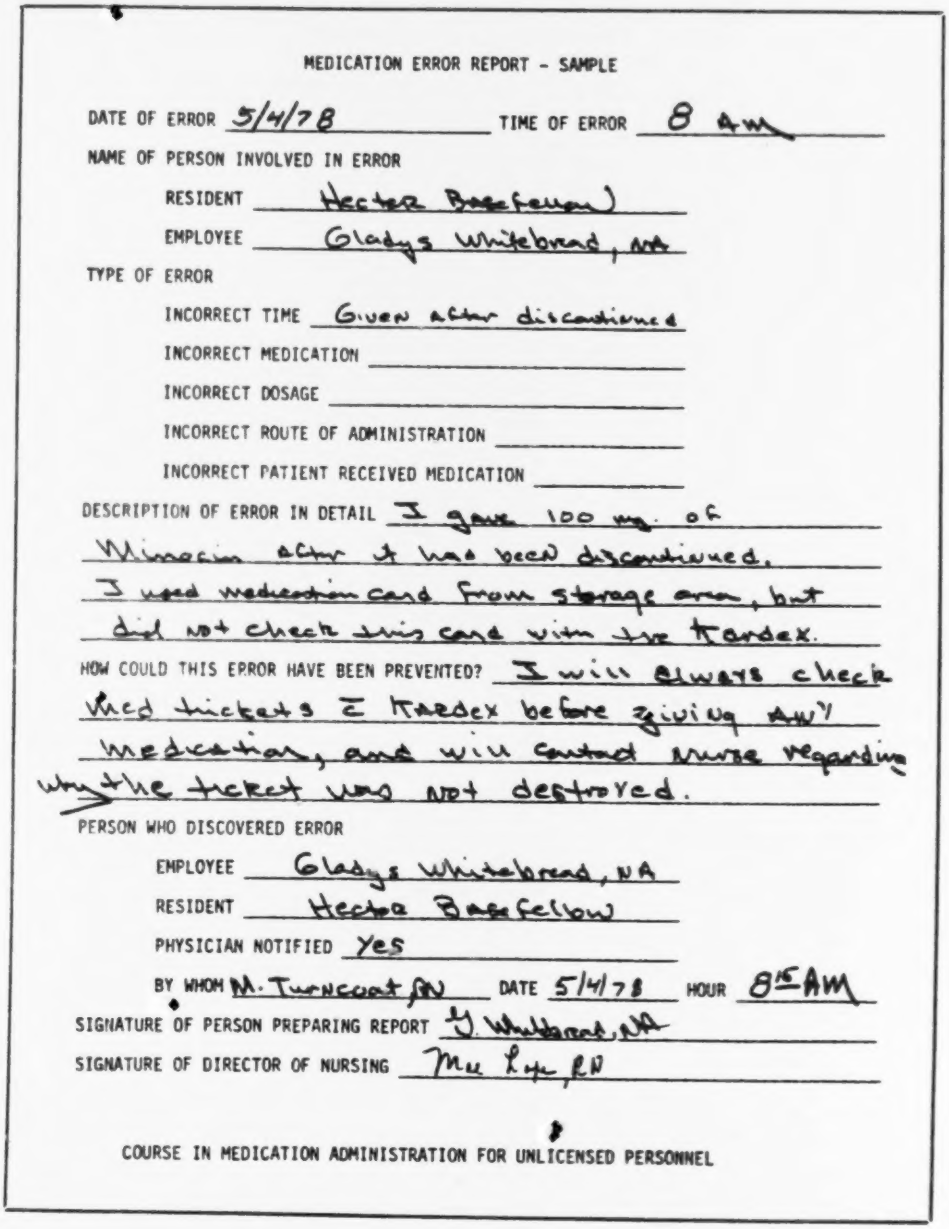
PHYSICIAN NOTIFIED ______________

BY WHOM ______________ DATE ______________ HOUR ______________

SIGNATURE OF PERSON PREPARING REPORT ______________

SIGNATURE OF DIRECTOR OF NURSING ______________

COURSE IN MEDICATION ADMINISTRATION FOR UNLICENSED PERSONNEL



MEDICATION ERROR REPORT - SAMPLE

DATE OF ERROR 5/4/78 TIME OF ERROR 8 AM

NAME OF PERSON INVOLVED IN ERROR

RESIDENT Hector Basefellow

EMPLOYEE Gladys Whitebread, NA

TYPE OF ERROR

INCORRECT TIME Given after discontinued

INCORRECT MEDICATION ______

INCORRECT DOSAGE ______

INCORRECT ROUTE OF ADMINISTRATION ______

INCORRECT PATIENT RECEIVED MEDICATION ______

DESCRIPTION OF ERROR IN DETAIL I gave 100 mg. of Minocin after it has been discontinued. I used medication card from storage area, but did not check this card with the Kardex.

HOW COULD THIS ERROR HAVE BEEN PREVENTED? I will always check med tickets c̄ Kardex before giving any medication, and will contact nurse regarding why the ticket was not destroyed.

PERSON WHO DISCOVERED ERROR

EMPLOYEE Gladys Whitebread, NA

RESIDENT Hector Basefellow

PHYSICIAN NOTIFIED Yes

BY WHOM M. Turncoat RN DATE 5/4/78 HOUR 8^{15} AM

SIGNATURE OF PERSON PREPARING REPORT G. Whitbread, NA

SIGNATURE OF DIRECTOR OF NURSING Mae Lope, RN

COURSE IN MEDICATION ADMINISTRATION FOR UNLICENSED PERSONNEL

Medication Error Report — Sample

BEST COPY AVAILABLE

Remember, everyone makes errors. Every error is potentially serious, even though the actual outcome might be trivial. Care must be taken to prevent errors from happening. Once an error does occur, the situation must be studied so that future similar errors might be prevented. If you make an error report the error immediately to your supervisor. Do not over-react: Keep your cool.

Part IV: Clinical Evaluation Checklists

Clinical Experience on Medication Administration

Objective:

Under licensed supervision, the student will successfully demonstrate correct medication administration procedures for each route (i.e., oral, rectal, topical) in a clinical setting. "Success" is defined as at least 90% correct on each checklist used in the evaluation.

Facility Directions for Use of Clinical Evaluation Checklists

Following successful completion of the educational institution's instruction and evaluation, this 7-part assessment must be completed for each candidate seeking a certificate of successful completion.

1. This evaluation is to be performed by a facility-employed registered nurse, currently licensed to practice in Minnesota.

a. This registered nurse is to be the candidate's immediate nursing supervisor, whenever possible.

b. In instances wherein the facility employees a licensed practical nurse as Health Services Supervisor, this evaluation must be performed jointly by this L.P.N. and the facility's consulting registered nurse, and signed by both persons.

2. No health-care facility is obligated to assign medication administration duties to any particular individual, even though such individual may have completed the educational institution's phase of instruction and assessment.

3. In most cases, facility nursing staff, working with the candidate, will be able to conscientiously sign each evaluation section on the candidate's first try. However, if the nursing staff feels that the candidate requires further instruction and/or experience, the evaluations should not be signed until competence is demonstrated.

4. Following receipt of the completed facility evaluations, the educational institution will submit its required documentation to the Minnesota Department of Health, which will analyze it and, if found acceptable, will issue numbered certificates to successful candidates via the educational institution. This process will take from 3 to 6 weeks.

5. Both the employing facility and the educational institution should be aware that the Federal Privacy Act of 1974 as well as Minnesota's Data Privacy Law (1974) as contained in Minnesota Statutes 15.162 to 15.169 (as amended by Minnesota Laws 1975, Ch. 401) will influence the release of student information.

6. Questions concerning this procedure or issues relating to certificate-candidates should be addressed to the nearest educational institution offering the Medication Administration Program for Unlicensed Personnel.

7. Trained unlicensed personnel recently employed by your facility should be evaluated using the checklists prior to their being authorized to administer medications under facility R.N. delegation and should not be assigned until 30 days of employment have been completed.

8. The Minnesota Department of Health encourages the practice of a periodic re-evaluation using these checklists of all trained, unlicensed persons administering medications. Every six months is suggested. Completed copies of these re-evaluations should be retained in the employee's personnel file.

Directions for Use of Checklist for Reporting Errors in Medication Administration and Lawful Charting

Item I. The instructor asks the student to orally identify five types of medication errors and give an example of each. The student must be able to list all five violations of rights and provide an example of each. It is an automatic failure to omit any of the five types of medication errors or their examples. An "X" is marked next to each item correctly identified.

Item II. The instructor describes a medication error incident to the student. The student is asked to orally identify all steps that a TMA responsible for a medication error should take. The response should include each of the four steps listed. Sequence and exact terminology are not important. An "X" is marked for each item identified by the student.

Item III. The instructor gives a blank medication error form to the student and reads the incident as described. The student is asked to complete the medication error form. The form may contain more than the items listed, but must contain complete descriptions of items 10-14. Place an "X" for each item correctly completed.

Item IV. The instructor provides the student with a blank medication sheet and nursing notes.

15 and 16. The instructor gives an example of an error in charting that might occur (e.g., TMA charted giving a medication to George Jones when it was given to Georgia Jones), and the student demonstrates how the recording error should be handled.

17 and 18. The instructor gives an example of a medication being withheld due to a contraindication. The student is asked to demonstrate how the recording of this occurrence is documented in the resident' record.

19 and 20. The instructor gives an example of a patient refusing a medication. The student is asked to demonstrate how this occurrence is documented in the resident's record.

Each of the above requires an identification of the incident on the medication form and a corresponding note in the nursing notes describing the occurrence.

The student must successfully complete 18 out of the 20 questions to pass this section of Unit VI.

Facility/
Student

Facility Name ______________________
Address ______________________
____
Evaluator ______________________
______________________ License #

Student Name ______________________
____
____
____
Total Possible - ____
Passing Score - ____
Key for scoring:
X - successful completion
O - Unsuccessful completion
Performance Standard - 90%
(18 out of 20)

Checklist for Reporting Errors in Medication Administration and Lawful Charting

I. * The student is able to identify five types of medication errors and give an example of each. (violations of the five rights)

1. ______ wrong resident and example
2. ______ wrong time and example
3. ______ wrong medicine and example
4. ______ wrong dose and example
5. ______ wrong method of administration (route) and example

II. Given a sample medication error the student is able to identify the steps that must be taken in response to the error.

6. ______ charge nurse notified immediately
7. ______ medication error report form completed
8. ______ entry made in resident's record of what happened, and what was done
9. ______ follow-up observation and documenation of the resident's condition

III. Margaret Jones was admitted this morning to your unit. Dr. Watts ordered Lasix 40 mg q.o.d. You were not sure but thought the order read q.i.d. and administered two doses today at 8 A.M. and 2 P.M. At 3 P.M. the patient complains of weakness, leg cramps and a pounding in her chest. The nurse notified the physician and corrective action has been taken. Have the student complete a sample medication error report.

The medication error report contains the correct description of:

10. ______ resident involved
11. ______ when error occurred (date and time)
12. ______ type and description of error
13. ______ corrective action taken
14. ______ signature of person preparing report

IV. Given a sample medication sheet and nursing notes, the student demonstrates the appropriate documenation for showing:

15 ______ an error in recording
16 ______ explanatory note
17 ______ withholding a medication because of contraindications
18 ______ explanatory note
19 ______ patient refused medication and
20 ______ explanatory note

COMMENTS:

Date ______________________________

Evaluator ___________________________

Student _____________________________

Facility Name ____________________

Address ____________________

Evaluator ____________________

____________________ License #

____________________ L.P.N.

____

Current license number

Student Name ____________________

____

Total Possible - 22

Passing Score - 20

Key for scoring:
X - successful completion
O - unsuccessful completion
Performance Standard - 90%

Facility/ Student

Checklist for the Administration of Oral Medications

1. _____ Stated purpose, side effects and warnings of the prescribed medication(s).
2. _____ When applicable, compared medication card with physician's order, Kardex, or resident's plan of care. Compared the medication ordered, the dosage, the route of administration and the time ordered.
3. _____ Washed hands.
4. _____ Assembled equipment necessary for oral administration.
5. _____ Checked that the label on the medication container corresponded with the medicine listed on the medication card (or other printed referece).
6. _____ Checked the medicine label for expiration.
7. _____ Checked the medicine label again while removing medication from the container.
8. _____ Prepared dosage for administration without touching the medicine.
9.* _____ Prepared the correct dosage (number of tablets) according to the prescribed dosage. Followed any additional instruction; e.g. crushed tablet.
10. _____ Poured liquid medications correctly (i.e., secured cap, shook properly if indicated, set cap top side down, poured away from label, held medicine glass at eye level, wiped lip of bottle, diluted all concentrates).
11.* _____ Prepared the accurate dose of liquid medication.
12. _____ Checked the medication label against the medication card while returning medication to resident's supply.
13. _____ Kept the medication with the medication card or other identification on the med tray. Always kept the medication and the medicard or other identification in a secure place.
14.* _____ Identified the resident prior to administration of medication by verifying his name; e.g., consulted wristband, asked resident's name, or asked a third person to verify resident's identity.

---

*Automatic failure

15. ______ Observed resident for any unusual conditions which should be reported to the licensed nurse prior to medication administration; e.g., undue drowsiness, difficulty swallowing.

16.* ______ Administered the correct medication to the correct resident at the correct time.

17. ______ Oral medication given with water unless contraindicated (cough medication or expectorant). Remained with resident until medication swallowed.

18. ______ Sublingual medication given under the tongue with instruction to the resident to retain medication under the tongue until the medication is dissolved. Sublingual medication given last if several medications administered to same resident.

19. ______ Troche or Lozenge given with instruction to resident to retain medication on the tongue until the medication is dissolved and not to drink any liquids.

20. ______ Cleaned and replaced equipment.

21. ______ Documented the medication administered.

22. ______ Returned to observe resident if medication was given for specific results. Observed and documented the results.

COMMENTS:

DATE ______________________________

EVALUATOR ______________________________

STUDENT ______________________________

*Automatic failure

Total Possible - 24
Passing Score - 22

Key for scoring:
X - Successful Completion
O - Unsuccessful Completion
Passing Score - 90% of Total Score

Checklist for Administration of Topical Medications: Eye Ointment

____ 1. Stated purpose for use, side effects, and warnings of prescribed eye ointment.

____ 2. When applicable, compared medication card with the physician's order, Kardex or resident's care plan for the resident's name, medication ordered, the dosage, route of administration, and the time ordered.

____ 3. Washed hands.

____ 4. Assembled equipment necessary for administration of eye ointment.

____ 5. Checked that the label on the medication container corresponded with the medication listed on the med card three times:

  a. When taken from the resident's supply

  b. When placed on med tray/drawer

  c. Prior to instilling in client's eye

____ 6. Checked for expiration date to be sure it is current.

____ 7. Always kept the ointment along with the med card or other identification in a secure place.

*____ 8. Identified resident prior to administration of medication by verifying his name; e.g., consulted wrist band, asked resident his name, or asked a third party to verify resident's identity.

____ 9. Explained procedure to resident.

____10. Had resident sit or lie down.

____11. Observed affected eye(s) for any unusual condition which should be reported to the licensed nurse prior to medication application.

____12. Cleansed eye with a clean wipe, wiping from inner corner outward once. When ointment was to be applied to both eyes, cleansed each eye with a clean wipe for each eye, wiping from inner corner outward **once**.

____13. Checked that label on the medication container corresponded with the medication on the medication card and removed cover from ointment.

____14. Positioned resident with head back and looking upward.

*____15. Retracted lower lid of the eye to be medicated. Approached eye from below, outside the resident's field of vision, using due care to avoid contact with the eye.

*____16. Prescribed ointment applied in a thin layer along inside lower lid.

____17. Lid held open a few seconds.

*Automatic failure

____18. Closed eyes gently. Asked resident to keep eyes closed for a few minutes. Wiped excess medication with a clean wipe.

____19. Positioned resident comfortably.

____20. Washed hands.

____21. Checked that the label on the medication container corresponded with the medication listed on the medication card and returned to the resident's supply.

____22. Cleaned and replaced equipment.

____23. Documented the medication administered.

____24. Returned to observe resident if eye ointment applied for specific results. Observed and documented the results.

COMMENTS:

DATE ______________________________

EVALUATOR ______________________________

STUDENT ______________________________

Total Possible = 24
Passing Score = 22

Key for scoring:
X = Successful Completion
O = Unsuccessful Completion
Passing Score = 90% of Total Score

Checklist for Administration of Topical Medications: Eye Drops

____ 1. Stated purpose for use, side effects, and warnings of prescribed medication.

____ 2. When applicable, compared medication card with the physician's order, Kardex or resident's care plan for the resident's name, medication ordered, the dosage, route of administration, and the time ordered.

____ 3. Washed hands.

____ 4. Assembled equipment necessary for administration of eye drops.

____ 5. Checked that the label on the medication container corresponded with the medication listed on the med card three times:

  a. When taken from the resident's supply

  b. When placed on med tray/drawer

  c. Prior to instilling in client's eye

____ 6. Checked for expiration date to be sure it is current.

____ 7. Checked to see if eye medication required dropper. If neccessary included a sterile dropper.

*____ 8. Identified resident prior to administration of medication by verifying his name; e.g., consulted wrist band, asked resident his name or asked a third party to verify resident's identity.

____ 9. Explained procedure to resident.

____ 10. Had resident sit or lie down.

____ 11. Observed affected eye(s) for any unusual condition which should be reported to the licensed nurse prior to medication application.

____ 12. Cleansed eye with a clean wipe, wiping from inner corner outward **once**. When eye drops are to be instilled into both eyes, cleansed each eye with a clean wipe for each eye, wiping from inner corner outward once.

____ 13. Checked that label on the medication container corresponded with the medication on the medication card and drew up ordered amount of medication into dropper.

____ 14. Positioned resident with head back and looking upward.

*____ 15. a. Separated lids of the affected eye by raising upper lid with forefinger and lower lid with thumb. Approached eye with dropper from below the eye, outside the resident's field of vision. Avoided contact with the eye. **OR**

  b. Gently drew lower lid down with forefinger: steadied hand on forehead, and held dropper, avoiding contact with eye.

---

*Automatic failure

*____16. Applied drop(s) gently near center of lower lid not allowing drop(s) to fall more than one inch before striking eye.

____17. Closed eyes gently. Asked resident to keep eyes closed for a few minutes.

____18. Wiped excess medication with a clean wipe using a separate clean wipe for each eye if drug administered to both eyes.

____19. Positioned resident comfortably.

____20. Washed hands.

____21. Checked that the label on the medication container corresponded with the medication listed on the med card and returned to the resident's supply.

____22. Cleaned and replaced equipment.

____23. Documented the medication administered.

____24. Returned to observe resident if eye ointment applied for specific results. Observed and documented the results.

COMMENTS:

DATE ______________________________

EVALUATOR ______________________________

STUDENT ______________________________

*Automatic failure

Total Possible = 24
Passing Score = 22

Key for Scoring:
X = Successful Completion
O = Unsuccessful Completion
Performance Standard = 90% of Total Score

Checklist for Administration of Topical Medications: Ear Drops

____ 1. Stated the purpose for use, side effects, and warnings of prescribed medication.

____ 2. When applicable, compared medication card with the physician's order, Kardex or resident's care plan for the resident's name, medication ordered, the dosage, route of administration, and the time ordered.

____ 3. Washed hands.

____ 4. Assembled equipment necessary for administration of ear drops.

____ 5. Removed medication from the resident's supply checking that the label on the ear medication container corresponded with the medication listed on the med card.

____ 6. Checked for expiration date to be sure it is current.

____ 7. Placed the medication along with the med card on the med tray, again checking medication against medication card. Included a dropper, if one required, but not included in the container. Always kept identification in a secure place.

*____ 8. Identified resident prior to medication administration by verifying his name; e.g., consulted wrist band, asked resident his name, or asked a third party to verify resident's identity.

____ 9. Explained procedure to the resident.

____ 10. Positioned the resident:

a. If lying in bed, put bed flat and turned head to opposite side.

b. If sitting in chair, tilted head sideways until ear as horizontal as possible.

____ 11. Cleaned entry to ear canal with a clean wipe

____ 12. Observed affected ear for any unusual condition prior to ear drop administration which should be reported to the licensed nurse.

*____ 13. Checked that label on the medication container corresponded with the medication on the medication card and drew up prescribed medication into the dropper.

____ 14. Did not contaminate the dropper by touching any part of the ear canal to the ear. Administered the ear drops by pulling the ear gently backward and upward.

*____ 15. Administered the number of drops prescribed into the ear canal.

*____ 16. Administered the medication to the affected ear.

____ 17. Instructed resident to maintain the required position for two or three minutes.

*Automatic failure

____18. If drops ordered for both ears, waited at least five minutes before putting drops in second ear, repeated same procedure.

____19. Left resident positioned comfortably.

____20. Washed hands.

____21. Checked that the label on the medication container corresponded with the medication listed on the med card and returned medication to the resident's supply.

____22. Cleaned and replaced equipment.

____23. Documented the ear drops administered.

____24. Returned to observe resident if ear drops instilled for specific results. Observed and charted the results.

COMMENTS:

DATE ______________________________

EVALUATOR __________________________

STUDENT ___________________________

*Automatic failure

Total Possible = 21
Passing Score = 19

Key for scoring:
X = Successful Completion
O = Unsuccessful Completion
Passing Score = 90% of Total Score

Checklist for Administration of Topical Medications: Skin Medications

____ 1. Stated purpose for use, side effects, and warnings of prescribed medication.

____ 2. When applicable, compared medication card with the physician's order, Kardex or resident's care plan for the resident's name, medication ordered, the dosage, site of administration, time ordered and the directions for adminstration.

____ 3. Washed hands.

____ 4. Assembled equipment necessary for administration of skin medication.

____ 5. Removed the medication from the resident's supply, checking that the label on the medication container corresponded with the medication listed on the med card.

____ 6. Checked for expiration date to be sure it is current.

____ 7. Always kept medication with identification in a secure place.

*____ 8. Identified resident prior to administration of medication by verifying his name; e.g., consulted wrist band, asked resident his name, or asked a third party to verify resident's identity.

____ 9. Explained procedure to the resident.

____ 10. Positioned the resident as necessary.

____ 11. Observed any unusual conditions of the affected area of the body prior to medication administration which should be reported to the licensed nurse.

____ 12. Cleansed affected area as indicated.

____ 13. Checked that the label on the medication container corresponded with the medication listed on the med card.

____ 14. Used clean tongue blade to remove medication if in a jar.

*____ 15. Administered the correct medication according to prescribed directions.

____ 16. Left resident in a comfortable position.

____ 17. Washed hands.

____ 18. Checked that the label on the medication container corresponds with the medication listed on the med card and returned medication to resident's supply.

____ 19. Cleaned and replaced (or discarded) equipment.

____ 20. Documented the medication administered.

____ 21. Returned to observe resident if skin medication given for specific results. Observed and documented these results.

---

*Automatic failure

COMMENTS:

DATE ______________________________

EVALUATOR ______________________________

STUDENT ______________________________

Total Possible - 25
Passing Score - 22

Key for Scoring:
S - Successful Completion
O - Unsuccessful Completion
Passing score - 90% of Total Score

Checklist for Administration of Rectal Medications

____ 1. Stated purpose for use, side effects, and warnings of prescribed rectal medication.

____ 2. When applicable, compared medication card with the physician's order, Kardex or resident's care plan for the resident's name, medication ordered, the dosage, route of administration, and the time ordered.

____ 3. Washed hands.

____ 4. Assembled equipment necessary for rectal administration.

____ 5. Checked the label on the medication container to see that it corresponds with the medicine listed on the medication card three times:

  a. When taken from the resident's supply

  b. When removed from the container

  c. When returning the remaining suppositories to the resident's supply.

____ 6. Checked for expiration date to be sure it is current.

____ 7. Always kept the suppository along with the med card or other identification in a secure place.

*____ 8. Identified resident prior to administration of the medication by verifying his name; e.g., consulted wrist band, asked resident his name, or asked a third party to verify resident's identity.

____ 9. Explained procedure to resident.

____10. Provided privacy, as necessary.

____11. Positioned resident on side with top leg flexed.

____12. Put on rubber glove or finger cot.

____13. Checked for correct medication and removed suppository from the wrapper or foil.

____14. Lubricated tip of suppository unless contraindicated.

____15. Encouraged resident to relax by instructing to breathe through mouth or take deep breaths.

*____16. Inserted suppository along the wall of the rectum beyond the sphincter, pushing it in gently with gloved finger.

*____17. Administered prescribed medication and dose.

____18. Slowly withdrew finger, pressed tissue against anus until urge to expel subsided.

____19. Removed and discarded finger cot or glove.

____20. Positioned resident comfortably.

*Automatic failure

____21. Gave resident any specific instructions.
____22. Washed hands.
____23. Cleaned and replaced equipment.
____24. Documented the medication administered.
____25. Returned to observe resident if suppoistory was given for specific results. Observed and documented the results.

COMMENTS:

DATE ______________________________
EVALUATOR ______________________________
STUDENT ______________________________

210

*Automatic failure

Follow-Up

Do you feel you are now capable of administering medications swiftly, skillfully and safely? If not, consult your instructor. If so, obtain a set of pink clinical evaluations from your instructor, follow his/her directions relative to returning to your employing long-term care facility for an "on-the-job" assessment. When you and your facility RN complete this assessment, ask the RN to return the pink packet to your instructor. A certificate will then be issued by the Health Department, forwarded to the instructor for signature and then sent to you.

Self-Administration

Many residents may well be able to move toward self-administration of medications when properly trained and supervised. The decision rests with the physician, but other members of the team are called upon to provide assessment, training and monitoring. Movement toward self-administration in certain individuals is to be encouraged.

The Appendix contains information on Self-Administration.

Refusal of Medication and/or Treatment

In the event a patient refuses medication and/or treatment, this refusaal must be reported to the nurse and documented in the patient's record.

Appendix

Advisory Committee for Medication Administration for Unlicensed Personnel

Robert Bergstrom
Community College System
301 Capitol Square
St. Paul, MN 55103

Dennis Boland
Dept. of Public Welfare
4th Floor Centennial Building
St. Paul, MN 55115

Marlene Deschler, Chief
Technical Consultation
and Training Section
MN Department of Health

Lois Green
Moose Lake State Hospital
1000 Lakeshore Drive
Moose Lake, MN 55767

Diane Hanson
Cedar Pines Nursing Home
2739 Cedar Avenue
Minneapolis, MN 55407

Mary Lou Learmont
Itasca Community College
Grand Rapids, MN 55744

Marge Renn
Moose Lake State Hospital
1000 Lakeshore Drive
Moose Lake, MN 55767

Marletta Lillejord
Preston Nursing Home
608 Winona
Preston, MN 55965

James K. Marttila
Fairview-St. Marys Medical Bulding
606 24th Avenue South
Minneapolis, MN 55744

Kathy Nardi
539 E. Annapolis
St. Paul, MN 55118

M. Lou Murphy
Cedar Pines Nursing Home
2739 Cedar Avenue
Minneapolis, MN 55407

Glenda Moyers
Department of Education
Room 525
550 Cedar Street
St. Paul, MN 55101

Georgia Pomroy
Minneapolis Technical Institute
1415 Hennepin Avenue South
Minneapolis, MN 55407

Common Stems

You will not be tested on this in this unit. It is for your general information; however, some of these stems may be found in other units, for which you will be responsible.

ANGI (o)—vessel
Angina—short for "angina pectoris"—a painful heart-vessel condition.

ARTER(i)—artery
Arteriosclerosis—hardening of arteries; a common condition in the elderly.

ARTHR(o)—joint
Arthritis—a painful stiffening of certain joints.

BRONCH(o)—bronchus, windpipe
Bronchiole—a small branch of the respiratory tree. (See Unit V).

BUCC(o)—cheek
Buccal medication route—the medication is placed in the cheek-pocket. (See Unit II).

CARCIN(o)—crab
Carcinoma—cancer (which often spread-out like crab-legs).

CARDI(o)—heart
Cardiograph—instrument for recording heart movement.

CEREBR(o)—cerebrum
Cerebral Vascular Accident (CVA)—a "stroke" involving the brain.

CRANI(o)—skull
Cranioplasty—plastic surgery of the skull.

CYST(o)—bladder or sac
Cystocele—hernial protrusion of the urinary bladder through the vaginal wall.

DERM(o)—skin
Dermassage—a lotion applied to the skin.

ENTER(o)—intestine
Parenteral route—a drug route outside the intestines e.g., through injection. (See Unit II).

GASTR(o)—stomach
Gastric juice—chemicals in the stomach which help digestion.

HEMO(o)—blood
Hemoglobin—the iron-containing part of red blood.

HYSTER(o)—uterus
Hysterectomy—excision of the uterus.

LACT(o)—milk
Lactation—giving milk.

LARYNG(o)—larynx
Laryngitis—inflammation of the larynx; hoarseness.

MAST(o)—breast
Mastectomy—excision of the breast.

NEUR(o)—nerve
Neurasthenia—a neurosis marked by chronic fatiguing, lack of energy, feelings of inadequacy.

OPHTHALM(o)—eye
Ophthalmology—the study and treatment of the eye and its diseases.

OST(o)—bone
Osteomyelitis—inflammation of the bone and bone marrow.

OT(o)—ear
Otic drugs—drugs given to treat a condition of the ear.

PATH(o)—disease
Pathology—the study of the modification of function and changes of structure caused by disease.

PHLEB(o)—vein
Phlebitis-inflammation of a vein.

PLASM—a thing formed
Neoplasm—a new and abnormal formation of tissue, as in a tumor.

PNEUM(o)—air
Pneumothorax—the accumulation of air or gas in the lung cavity.

PROCT(o)—rectum
Proctoscope—an instrument for inspecting the rectum.

PSYCH(o)—soul, mind
Psychoneurosis—any one of a group of diseases of the mind.

RHIN(o)—nose
Rhinology—the study of the nose and its diseases.

THORAC(o)—chest
Thoracoscopy—the diagnostic examination of the chest.

TRACHE(o)—windpipe
Trachea—the windpipe

Common Prefixes

You will not be tested on this material. It is for your general information; however, some of these prefixes (and suffixes) may be found in other units, for which you are responsible.

Among the most frequently used elements in the formation of medical words are prefixes. A prefix consists of one or more syllables placed before a word to show certain relationships. The following are a few of the most commonly used medical prefixes listed together with their meanings and an example:

A-, AN- without, lack of (a—used consonants, an—before vowels)
Asepsis—free from infection. Anorexia—loss of appetite)

AB- away from
Abnormal—deviating from normal

AD- to, toward
Adduct—to draw toward a center or median line

AMBI- both, on both sides
Ambidextrous—ability to use either hand effectively

ANA- up; back again
Anaphylaxis—a reaction which occurs only after the person has been sensitized (penicillin may cause an anaphylactic reaction in sensitive persons)

ANTE- before, forward
Anterior—toward the front

ANTI- against, opposed to
Antiseptic—preventing infection or inflammation

BI-, BIS- two, twice
Binocular—having two eyepieces, as in a microscope.

Cal- large calorie

CIRCUM- around, about
Circumcision—removal of all or part of foreskin of the penis

CONTRA- against, opposite
Contraindications—conditions present in the patient that suggest **not** using a certain drug

COUNTER- against, opposed
Counterirritant—a soothing agent which acts against irritation; e.g., a lotion

DIS- reversal, separation
Disarticulation—amputation or separation at a joint

DYS- difficult, painful
Dysuria—painful and difficult urination

EC-, ECTO-, EX-, EXO- out, outside, away from
Ectopic—out of normal place (as in ectopic pregnancy)

ENDO- within, insde
Endoskeleton—the boney skeleton inside the body

ENTO- inside, within
Entocele—internal hernia

EPI- on, upon
Epidermis—outermost or top layer of skin

EXTRA- outside of, beyond, in addition to
Extrasensory perception—knowledge gained outside the usual five senses

EU- well
Eupnea—normal respiration. Euphoria—an exaggerated sense of well-being

HEMI- one-half
Hemiplegia-being paralyzed on one side only; as resulting from a stroke

HEMO- pertaining to the blood
Hemophilia—a blood disease characterized by deficiency of a blood clotting factor

HYPER- above, over excessive
Hypertension—abnormally high tension: especially high blood pressure

HYPO—lack, deficiency
Hypoglycemia—abnormally low blood sugar

IM-, IN- not
Incontinent—not able to control bladder or bowel functions

INTER- between
Intermittent—marked by periods of activity and inactivity

INTRA- within, on the side
Intraocular—within the eye

ISO- equal, like
Isometric—pertaining to the same measure of length

NEO—new
Neonatal—new-born

OB- against, in front of
Obstruction—the act of blocking or clogging (as in bowel obstruction)

ORTHO- straight, normal
Orthodontist—a dentist who specializes in straightening teeth

OSTEO- bone
Osteoporosis—softening of the bone (a common condition in the elderly)

PATHO- pertaining to disease
Pathology—study of diseases

PERI- round about, beyond
Perivascular—around a vessel

PHARM- drug
Pharmacology—the science dealing with the preparation, uses and especially the effects of drugs.

Pharmacy—the science dealing with the preparation and dispensing of drugs.

PHOTO- light
Photosensitive- sensitive to light (a special consideration of many drugs)

POST- after, behind
Post-op—after the operation

PRO- forward, before
Prognosis—a forecast as to the probable result of a disease

RE- back, again, contrary
Relapse—return of a disease after improvement

SEMI- half
Semicoma—a stupor from which a patient can be aroused

SUB-, SUP- under, moderately
Subnormal—below normal (e.g., subnormal temperature)

SUPER- above, in excess of, over
Superinfection—an overgrowth of infectious organisms

SYN- with, together
Syndrome—a set of symptoms occurring together, e.g. Down's syndrome

THERM-, THERMO- heat
Thermometer—an instrument for measuring temperature

TOX-, TOXI- poison
Toxemia—poisoned condition of the blood

TRANS- across, through
Transfusion—transfer of blood or components from one individual to another

Common Suffixes

A suffix consists of one or more syllables added at the end of a word to show various relationships. The most commonly used medical suffixes and other word endings are listed below together with their meanings and an example.

-ALGIA— pain

Neuralgia—severe pain along the path of a nerve

-BLAST— young cell

Leukoblast—a young cell found e.g. in the blood of those with leukemia

-CELE— swelling

Hydrocele—a collection of fluid in the testis, e.g. as in a hernia

-CIDE— killer

Cidal—killing

Bacteriocidal—killing to bacteria

-CYTE— a hollow vessel, a cell

Erythrocyte—a yellowish, circular, disc found in the blood; it contains hemoglobin and carries oxygen to the tissues.

-ECTOMY— excision, cutting out

Appendectomy—excision of appendix

-EMIA— blood related condition

Glycemia—sugar in the blood

-GIST— one who studies

Bacteriologist—one who studies bacterial organisms

-GRAPH, -GRAPHY— writing or recording

Cardiography—the recording of the heart's movements

-ID— resembling

Vivid—having the color or freshness of life

-ITIS— inflammation

Tonsillitis—inflammation of the tonsils

-LOGY— the science or study of

Gerontology—the science and study of aging, especially the special problems of the elderly.

-MANIA— madness or irrational desire

Kleptomania—an irrational impulse to steal

-OID— like, similar

Humanoid—a robot; similar to the human form

-OMA— indicating a morbid condition, especially a tumor

Carcinoma—a malignant tumor

-OSIS— a disease condition or morbid process

Hemochromotosis—excessive iron (from "hemoglobin") in the blood and tissues

-PATHY— a morbid condition, disease

Dermopathy—a skin disease

-RHAGE— profuse flow, a breaking or bursting forth

Hemorrhage— a copious escape of blood from the vessels; excessive bleeding

-RHEA— flow
Menorrhea—normal menstruation

-TOMY— cutting or incision
Cholecystectomy—removal of the gall bladder

-TROPHIC— relating to nourishment
Hypertopic— marked by a morbid enlargement of an organ. Ex., many elderly men suffer from an enlargement of the prostate gland = hypertrophic prostate.

A

Self-Administration

This section is included to remind the registered nurse of those areas that must be considered when developing a plan for an individual client.

Guidelines for Self-Administration of Medications

Legal Considerations

Self administration of medications (by any route) will be permitted only when specifically ordered by the responsible physician. *(JCAH) (Rule 34)

Drugs shall be stored under proper conditions of sanitation, temperature, light, moisture, ventilation, segregation and security. (JCAH)

All drugs shall be kept under lock and key. (JCAH)

The security requirements of Federal and State laws shall be satisfied in storerooms, pharmacies and patient treatment areas. (JCAH)

Drugs requiring special conditions for storage to ensure stability shall be properly stored. (JCAH) (Rule 34)

Clients shall never have direct access to medication cupboard/cart.

*JCAH—Joint Commission on the Accreditation of Hospitals

Client Teaching prior to and during self-administration of medications is of vital importance. Do NOT assume. Check everything carefully. There is much information available on client teaching. There are numerous techniques that should be utilized: individual counseling, group counseling, films, slides, diagrams, demonstrations and return demonstrations.

Be sure to individualize your client teaching and meet the client's needs by:

assessing client for current level of functioning and knowledge.

planning your presentation so it is in logical order, steps not missed, and everything needed is available.

presenting at client's level of understanding; give written information (along with verbal) and encourage questions.

summarizing all parts of lesson, emphasizing the more difficult parts and verifying that client did learn and can perform task as taught.

The following areas must be covered:

1. **Knowledge of medication**

name, dosage, route and method of administration
reason for taking—desired effect

when to take—any special instructions for taking in order to be effective
precautions
possible side effects

2. **Importance of taking** the **right dose**, of the **right medication** at the **right time** by the **right route**.

Do NOT increase or decrease dosage.

Do NOT borrow or lend medications.

Do NOT save old medications or self-medicate.

Regular time schedule is important.

Over-the-counter (OTC) medications are often over used or misused. May be contraindicated with certain prescribed medications.

3. **When/What to report to staff**

anything unexpected
when a question arises
if medications not taken as ordered
effects of medications—either desired or side effects

4. **How to obtain medications**

prescription—where to get?
pharmacy—where? hours?
refills—how often? where?

5. Proper storage—safe secure place

any special requirements—Examples: dark bottle, refrigerate

6. Provision for security (for equipment as well as medications) should not be accessible to unauthorized persons, i.e. children, regressed, mentally retarded, abusers, etc.

Recording

Nursing Staff:

On Medication record DPW-ML 353 (see page 44 y(5))

On **Progress Notes** DPW 1035, document all client teaching done and response of client; observations made as to how client takes medications and adherence to procedure(s) taught; effectiveness of medications; any side effects reported or noted.

Client:

Whether client charts administration of medications will be determined by the Ward RN who is supervising the client teaching being done.

Studies have shown that fewer errors occur when clients chart medications that are self-administered.

Client charting provides a good record to verify taking of medications.

If client is to chart, he should be taught to use the Medication Record DPW-ML 353 correctly. This record will become a permanent part of the client's personal file.

Written: June 1978

Margaret Renn, R.N.
Approved by RN Group

Jane I. Allen, R.N., Director of Nurses

Courtesy of Moose Lake State Hospital, Moose Lake, MN.

Major Categories of Medications	Note: you will not be tested on these terms and definitions; they provide information on drug classifications and purpose for use, that will be helpful in later Units.
Adrenocorticoid Otic	A drug used to treat ear infections (e.g., Neomycin, Polymyxin B, Hydrocortisone).
Analgesic	A pain-relieving remedy (e.g., Darvon, aspirin, Tylenol, Demerol).
Antacid	An agent that reduces or eliminates acids in the stomach (e.g., Maalox, MOM).
Antianemic	A preparation used to increase the number of red-blood cells (e.g. Feosol).
Antianxiety	A substance that treats anxiety (e.g. Valium).
Antiasthmatic	An ageent used to treat asthma (e.g., Intal).
Antihelmintic	A substance used to kill worms in the Gastro-Intestinal Tract (e.g., Povan).
Antibacterial	A substance that kills or slows the growth of bacteria, (e.g., ampicillin, cephalexin, erythromycin, tetracycline, sulfamethoxazole). Ophthalmic antibacterial includes Gantrisin.
Anticoagulant	An agent which slows blood clotting (e.g., Coumadin).
Anticonvulsant	A substance that prevents or stops seizures (e.g., Dilantin, phenobarbital, carbamezepine).
Antidepressant	A medication used to treat depression (e.g., Elavil).
Antidiabetic Agent	A drug used to treat and control mild and uncomplicated diabetes (e.g., Orinase).
Antidiarrheal	An adjunct to the treatment of diarrhea (e.g. Lomotil)..
Antifungal	A drug used to treat fungal infections, most specifically, candidiasis e.g. of the vagina (e.g., Monistat).
Antihistamine	A "drying" agent used to treat allergic symptoms (e.g., Benadryl).
Antiparkinsonism Agent	A drug used to treat Parkinson disease that may or not be caused by other drugs (e.g., L-dopa, Sinemet).

A medication used to treat psychosis and to control behavior (e.g., Mellaril, Thorazine, Haldol, Navane, Lithium Carbonate).	**Antipsychotic and Antimanic Agent**
A substance which slows the growth of susceptible germs but does not necessarily kill them (e.g., Hydrogen Peroxide).	**Antispetic**
A drug used to relieve muscle spasm (e.g. Bentyl).	**Antispasmodic**
An agent that causes contraction of tissue (e.g., Alum).	**Astringent**
To treat asthma patients or others with bronchospasm (e.g., Ventolin, Proventil).	**Bronchodilator-Albuteral Inhalation**
a drug used to treat various circulatory disorders such as angina, arrhythmias, Tachycardia, hypertension, together with diuretics used to increase urinary output (e.g., Inderal, Lasix, nitroglycerin)..	**Cardiovascular Agent**
A compound used to induce bowel movement (e.g., Epsom Salts).	**Cathartic**
A substance used to destroy tissue by local application (e.g., Silver Nitrate).	**Cuastic**
A drug which promotes blood clotting (e.g., Vitamin K).	**Coagulant**
An agent which produces a local inflammation of the skin for the relief of a more deep-seated inflammation (e.g., liniment, such as Heet).	**Counterirritant**
A drug used to stimulate the formation of urine (e.g., Lasix).	**Diuretic**
A drug used to induce vomiting (e.g., Ipecac).	**Emetic**
A substance which is used to soothe or soften tissue (e.g., cold cream).	**Emollient**
A substance used to induce coughing and flow of fluid from the respiratory tract (e.g., Robitussin).	**Expectorant**
An agent which tends to increase the hemoglobin content of the blood; a blood-builder (e.g., Feosol).	**Hematinic**
A drug which tends to lower the blood pressure. Also called "antihypertensive" (e.g., Aldactone).	**Hypotensive**
An agent which stimulates and loosens the bowels (e.g., Dulcolax, Metamucil, MOM, Colace).	**Laxative**
A drug sued to treat scabies, head and crab lice (e.g., Kwell).	**Pedicalicide, Scabicide**
Medications used to replenish electrolytes, especially potassium (e.g., KCL, or K-Lor).	**Potassium Supplements**
An agent that quiets activity or induces sleep (e.g., Dalmane).	**Sedative/Hypnotic**
A substance used to treat various dermatitis conditions, or skin conditions due to insect bites, poison ivy, and the like (e.g., hydrocortisone).	**Topical Steroid**
An agent that can suppress anxiety and modify disturbed behavior in doses that are not profoundly hypnotic. (e.g, Compazine).	**Tranquilizer**
An agent used to constrict (make smaller in diameter) the blood vessels. (e.g., Neo-Synephrine).	**Vasoconstrictor**
An agent used to dilate (make larger in diameter) the blood vessels (e.g., Pavabid).	**Vasodilator**

C

Suggested References

American Society of Hospital Pharmacists: *American Hospital Formulary Service*, Washington, D.C., American Society of Hospital Pharmacists, 1975.

Anthony, C. & Thibodeau, G., *Structure and Function of the Body*, 6th Ed., St. Louis, C.V. Mosby Co., 1980.

Bartilucci, A.J. and Durgin, J.M.: *Giving Medications Correctly and Safely*, Oradell, N.J., Medical Economics Book Division, 1976.

Bayt, P., *Adminstering Medications*, Indianapolis, Bobbs-Merrill, 1982.

Bergersen, B.: *Pharmacology in Nursing*, 14th Ed., St. Louis, C.V. Mosby Co., 1979.

Bregman, M.S.: *Assisting the Health Team*, St. Louis, C.V. Mosby Co., 1974.

Goodman, L.S. and Gilman, A.: *The Pharmacological Basis of Therapeutics*, 5th Ed., New York, Macmillan, 1975.

Handbook of Nonprescription Drugs, 6th Ed., Washington, D.C., American Pharmaceutical Association, 1979.

Hitner, H., and Nagle, B., *Basic Pharmacology for Health Occupations*, Indianapolis, Bobbs-Merrill Educational Publishing, 1980.

Hospital Research and Educational Trust: *Being a Nurse Aide*, Washington, D.C., Robert J. Brady Co., 1969.

Kapit, W. and Elson, L.: *The Anatomy Coloring Book*, New York, Canfield Press, 1977.

Kent, T., Hart, M., Shires, T., *Introduction to Human Disease*, New York, Appleton-Century-Crofts, 1979.

Leake, M.J.: *A Manual of Simple Nursing Procedures*, 5th Ed., Philadelphia, W.B. Saunders, 1971.

Long, J.W.: *The Essential Guide to Prescription Drugs*, New York, Harper & Row, 1977.

Physician's Desk Reference, Oradell, N.J., Medical Economics, (New edition published yearly).

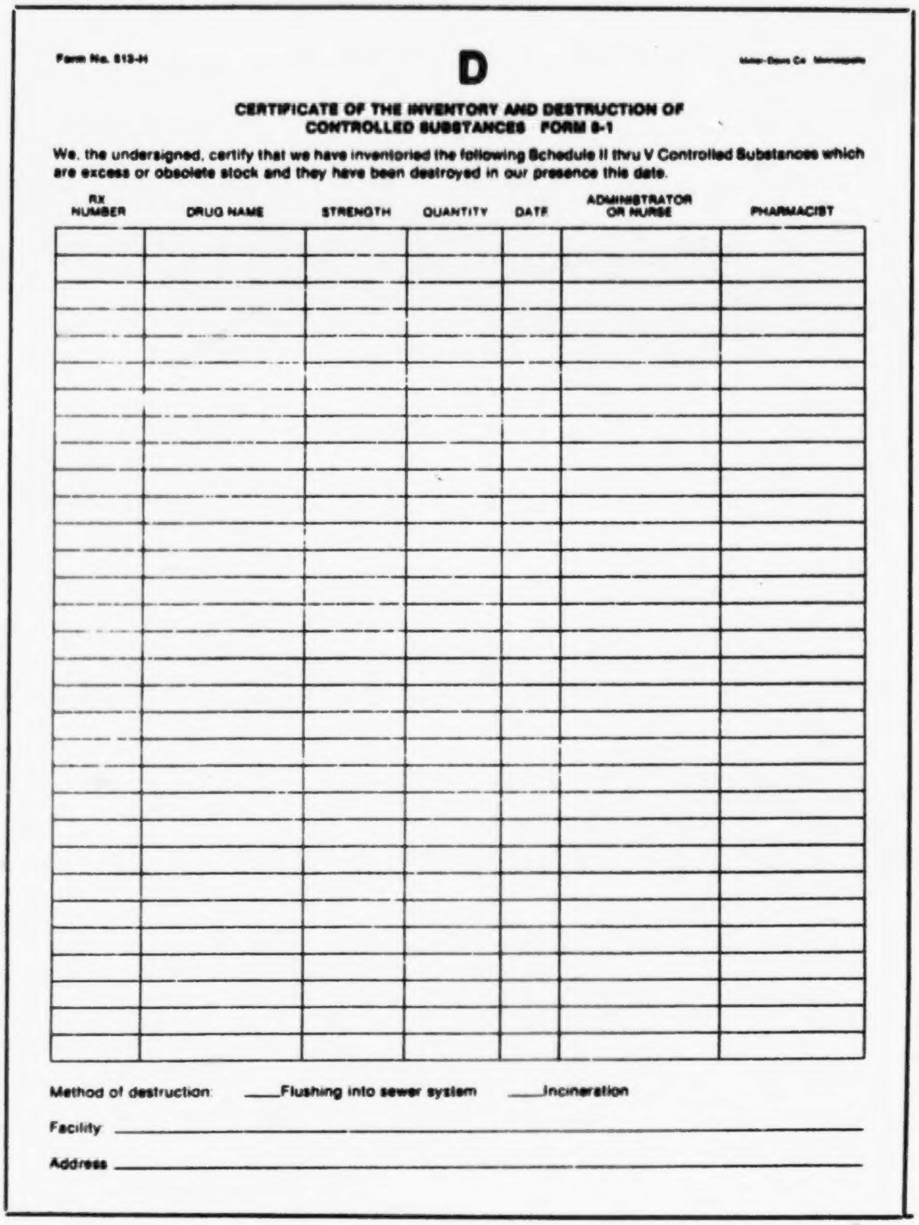
Taber's Cyclopedic Medical Dictionary, 14th Ed., Philadelphia, F.A. Davis, 1981.

United States Pharmacopeia Dispensing Information: Drug Information for the Health Care Provider, Vol. I, 1983, Rockville, M.D., U.S. Pharmacopeial Convention, 1982.

Velanoff, J.: *Law: A Case Study Approach*, Canada, Pitman Press, Ltd., 1968.

Wade, O.L: *Adverse Reactions to Drugs*, London, William Heinemann Medical Books, Ltd., 1970.

Wood, L.A., (Ed.): *Nursing Skills for Allied Health Services*, Volumes 1, 2 and 3, Philadelphia, W.B. Saunders, 1974.



Form No. 513-H

D

Miller-Davis Co. Minneapolis

CERTIFICATE OF THE INVENTORY AND DESTRUCTION OF CONTROLLED SUBSTANCES FORM 8-1

We, the undersigned, certify that we have inventoried the following Schedule II thru V Controlled Substances which are excess or obsolete stock and they have been destroyed in our presence this date.

RX NUMBER	DRUG NAME	STRENGTH	QUANTITY	DATE	ADMINISTRATOR OR NURSE	PHARMACIST

Method of destruction: ____Flushing into sewer system ____Incineration

Facility ____

Address ____

BEST COPY AVAILABLE

DISPOSITION OF CONTROLLED SUBSTANCES

The Drug Enforcement Administration has allowed an optional method for the disposition of Controlled Substances in long term care facilities in Minnesota employing a consultant pharmacist. Drugs in Schedules II through V may now either be inventoried and surrendered to the D.E.A. Kansas City Regional Office or they may be destroyed in the facility in accordance with the following conditions.

1 All controlled substances destroyed must be destroyed in the presence of the administrator or designee and either the consulting or vendor pharmacist.

2 An inventory of **all** controlled substances destroyed and the date and method of destruction must be submitted to the D.E.A. on a **monthly basis.**

3 The certificate of destruction must be furnished to the D.E.A. within 30 days from the time that the drugs were actually destroyed

4 Mail original copy to

Drug Enforcement Administration
1150 Grand Avenue Room 400
Kansas City, MO 64106

5 A copy of the certificate of destruction with signatures shall be retained in the facility for 2 years.

Form 8-1 can also be utilized for the recording of the destruction of non-controlled drugs. When so used, neither the form title nor the certification statement would be applicable. The form title could be changed so as to read 'NON-CONTROLLED SUBSTANCES'. The certification statement could be ignored and/or crossed out. A pharmacist is not required to witness such a destruction. Another facility staff person could serve as the witness. The completed form would not be sent to D E A but placed into the resident's health care record. The medications of only one resident would be entered on any one form. Resident's identification data should be present on this form.

Note Controlled drugs should not be returned to the pharmacy for destruction or for reuse.

Mn Dpt Hlth/TC&T/A.R./Revised 1/79

BEST COPY AVAILABLE

Index

Abbreviations (medical), 51-54, 59-62
Absorption (of a drug), 35, 44, 46, 129
Acetaminophen, 142
Acidosis, 107
Action (of a drug), 35, 42, 128, 130, 137
Acute conjunctivitis (pink eye), 89, 115
Administration of medications, 1, 11, 12-14, 19, 69, 71, 73, 161-210 (Unit VI)
Adrenal glands, 113-114, 125
Adrenocorticoid drugs (otic), 77, 145
Adverse reactions, 13, 69, 71, 73, 74, 82, 96, 135-139
Aerosol, 35, 40, 171
Aging (& the elderly), 95-96, 137, 139
Alkalosis, 107
Alimentary canal, 110-111, 124
Allergies. See Hypersensitivity.
Alveoli, 47, 107
Alzheimer's Disease, 89, 102
Aluminum hydroxide, 143
Amphetamine, 1, 7, 9, 29, 72
Ampicillin, 144
Analgesic, 77, 142-143
Anatomy, 89, 95, 97
Anemia, 89, 99
Angina (pectoris), 45, 89, 105
Antacid, 77, 143
Antagonistic effect (of drugs), 44
Antagonistic pairs (of muscles), 100
Antianxiety, 77, 143
Antiasthmatic, 77, 144
Antibacterial, 77, 144
Anticoagulant, 77, 142, 145
Anticonvulsant, 77, 146
Antidepressant, 77, 147
Antidiabetic agent, 77, 147
Antidiarrheal, 77, 147
Antidote, 43
Antifungal, 77, 147
Antihistamine, 77, 148
Antiparkinsonism agent, 77, 148
Antipsychotic/Antimanic agent, 77, 149-150
Anuria, 89, 110
Appendicitis, 112
Appendicular skeleton, 117
Aphasia, 89, 101
Aqueous solution, 35, 39-40

Arabic numbers/Roman numerals, 53, 62
Arrhythmia, 89, 105
Artane, 148
Artery(s), 89, 103, 120
Arteriosclerosis, 89, 105
Arthritis, 89, 99
Aspirin, 2, 142, 145
Asthma, 77, 89, 108
Astigmatism, 89, 115
Astringent, 172
Atherosclerosis, 89, 105
Atomizer, 40, 47
Atrium (atria), 89, 103, 120
Atrophy, 89, 100, 102
Automatic stop order, 1, 11, 12, 16, 23, 57
Autonomic nervous system, 101
Axial skeleton, 117

Bactrim, 144
Barbiturate, 1, 7, 9
Benadryl, 77, 137, 148, 154
Benzidrine, 72
Biological(s), 1, 14, 26
Boarding care homes, 17
Bone, 97, 99
Bradycardia, 89, 106
Brain, 100
Brand (or trade) name, 69, 72-73, 75-76
Bronchodilator, 77, 150
Buccal, 35, 46, 60

Cancer (carcinoma), 89, 95
Capillaries, 89, 103
Capsule, 35, 41
Cardiac arrest, 43, 89, 106
Cardiovascular agent, 77, 150-151
Cardiovascular System, 97, 103-106, 120
Cartilage, 99
Cataract, 89, 115
Category (of a drug), 72, 74, 77, 80-81, 139
Cell, 89, 96
Central Nervous System, 89, 100
Cerebrovascular Accident (CVA). See Stroke.
Chart (or Record or File), 1, 15, 180
Charting, 83, 179-185

Checklists (for Clinical Evalutions), 193-208
Chemical Dependency (CD) Units, 4-5, 25-27
Chemical name (of a drug), 69, 72
Circulatory System. (See Cardiovascular System).
Cirrhosis, 89, 112
Classification (of drugs), 137, 142-154
Clinical Evaluation. (See Checklists).
Codeine, 29
Cogentin, 148
Colace, 152
Composition (of a drug), 69, 71
Concentration (of a drug), 35, 39
Concussion, 89, 101
Congestive heart failure, 89, 105
Constipation, 89, 111
Contraction, 90, 100
Contraindication(s), 65, 69, 71, 73, 75-76, 138-139
Controlled Substance(s), 1, 6, 7, 8, 13, 16, 29, 165
Controlled Substance Act of 1970, 1, 5, 7, 9
Contusion, 90, 101
Coronary Artery Disease, 105
Cortisporin otic, 145
Coumadin, 145
Cumulative effect, 35, 43
Cyanosis, 90, 105, 106
Cystitis, 90, 110

Dalmane, 77
Darvon, 29, 143
Datril, 142
Dementia, 90, 101-102
Demerol, 143
Depressant, 1, 13
Dermis, 114, 126
Dermal pads, 151
Diabetes mellitus, 90, 113
Diarrhea, 90, 111
Diastolic pressure, 90, 104
Diazepam. (See Valium).
Digestion, 110-111
Dilantin, 77, 145
Disability, 95
Disposition of medications, 16, 27
Distribution of a drug, 90, 129
Diuretic, 77, 90, 151

Dosage, 57, 73, 75, 79, 139, 142-154
Dose (kinds of and preparation of), 35, 42, 167-168
Drug. (See Medication).
Drug Enforcement Agency (DEA), 7, 9, 16, 58
Dulcolax, 152
Dysphagia, 90, 112
Dyspnea, 90, 106, 108
Dystrophy, 90, 100
Dysuria, 90, 110

Ear, 46, 97, 115, 127, 145
Ear Drops (Procedure for Administering), 177-178, 203-204
Edema, 90, 106
Effect(s) of a drug, 35, 42, 128
EKG. See electrocardiogram.
Elavil, 147
Electrocardiograph (EKG), 90, 104
Electrolytes, 77
Elixir, 35, 40
Embolus, 90, 105
Emergency drugs, treatment, 14, 23, 55, 141
Emphysema, 90, 108
Emulsion, 39
Encephalitis, 90, 103
Endocrine System, 97, 112-114, 125
Endometrium, 90
Enteric-coated tablets, 35, 41, 45
Epidermis, 114-115, 126
Epilepsy, 90, 102
Error (in drug administration), 23, 167, 187-191, 194-196
Error Reports, 189-190
Erythromycin, 144
Esophageal varices, 112
Eustachian tubes, 107, 127
Excretion (of a drug), 90, 130
Expectorant, 77, 151
Extract, 35, 40
Eye, 46, 97, 115, 127
Eye Drops (Procedure for Administering), 174-175, 201-202
Eye Ointment (Procedure for Administering), 175-176, 199-200

Family (or Category) of a drug, 72, 75, 76
Fatigue, 90, 106
Feces, 111
Federal Register (Excerpts), 5, 11-12, 19-23

Fibrillation, 90, 105
Fibrosis (of the lung), 108
Fluidextract, 40
Food & Drug Act, 5, 8-9
Food & Drug Administration, 8-9
Form (preparation) of a drug, 35, 59, 71
Fracture, 90, 99

Gallbladder, 111
Gantrisin, 145
Gargle, 171
Gastrointestinal (GI) System, 96, 97, 110-112, 124
Gel, 40
Gelatin, 35, 41
Generic name (of a drug), 69, 72, 73
Glaucoma, 90, 115
Glycerin, 172
Goiter, 113
Gonads, 113, 125
Guidelines for Administering Medications, 163-165

Haldol, 149
Heart, 103-106, 120
Heart Disease, 95, 104-106
Hematemesis, 90, 112
Hematuria, 90, 110
Hemoptysis, 90, 106
Hemorrhage, 91, 106
Hernia (inquinal), 91, 112
Hormone(s), 100, 112-114, 125
Hospital Formulary, 16
Hydrocortisone, 145, 154
Hyperopia, 91, 115
Hypersensitivity, (allergies, anaphylaxis), 36, 43, 138, 141, 148
Hypertension, 91, 104-106
Hypodermic, 1, 12, 47-48, 60
Hypotension, 104
Hypothalamus, 113, 125
Hysterectomy, 91, 109

Ibuprofen, 143
Idiosyncrasy, (of a drug), 43
Inderal, 150
Indication(s) (or Usual Uses(s) for medication), 69, 71, 73, 75, 76, 142-154
Inhalation of medications, 36, 47, 144

Initial Dose, 35, 42
Insertion of medications, 36, 44, 46
Instillation of medications 36, 44
Intal, 144
Interaction of drugs, 36, 44, 139
Intermediate Care Facilities, 11
Intradermal, 36, 44, 48, 60
Intramuscular, 36, 44, 48, 60
Intravenous, 36, 44, 48, 60
Ischemia, 91, 105
Involuntary nervous system, 101
Irrigation, 36, 44
Islets of Langerhans, 111

Jaundice, 91, 112
Joint, 91, 99

Keflex, 144
Keys (to medicine cabinet), 12, 14
Kwell, 153

Labels (on medication containers), 7, 8, 9, 15, 23, 26, 164, 166-169
Larynx, 107, 121
Lasix, 151
Law (general considerations), 1, 3
Laxative, 77, 80, 152-153
L-Dopa, 148
Legend drug(s), 1, 6, 13
Lethal dose, 35, 42
Leukemia, 91, 99
Leukocytes, 93, 99
Licensed nurse, 1, 3, 4, 19-22, 128, 193
Life span, 95
Ligament, 91, 99
Liniment, 36, 40, 171
Liquid preparations of drugs, 39-40
Lithium carbonate, 150
Liver, 111-112, 124, 130
Local effect of a drug, 36, 44
Lomotil, 147
Lotion, 36, 40, 171
Lozenge. (See troche).
Luminal, 146
Lymph, 91, 103
Lymph node(s), 91, 103, 107

Magnesium hydroxide, 143, 152
Maintenance dose, 35, 42
Maximum dose, 35, 42
Medication (definition), 1, 6, 8, 35, 39
Medication container, 14-15, 26
Medication Order, 55-58
Medication Record, 180-184
Medicine cabinet, 14, 23
Medicine card or ticket, 161, 165, 169
Melena, 91, 112
Mellaril, 149
Menarche, 91, 109
Meningitis, 91, 103
Menopause, 91, 109
Menstruation, 108
Mental retardation units, 19-27
Metabolism, 43, 91, 129-130
Metamucil, 152
Milk of Magnesia (MOM), 40, 77, 80, 143, 153
Minimum dose, 35, 42
Minnesota Department of Health (MDH), also known as Minnesota Health Department (MHD), 4, 5, 194
Minnesota Department of Health, Regulation #53, 5, 12-17
Minnesota Department of Health, Reg. #397 & 398, 5, 25-27
Miscarriage, 91, 109
Mixture, 36, 40
Monistat, 147
Morphine, 2
Motrin, 143
Mucous membrane(s), 36
Muscular System, 97, 99-100, 118
Multiple sclerosis, 91, 102
Myelin, 102
Myocardial infarct, 91, 105
Myocardium, 91, 104
Myopia, 91, 115

Narcotic, 2, 7, 9, 15, 29, 143
Narcotics record book, 15
National Formulary, 8
Navane, 150
Neomycin, 145
Nerves, 100, 102
Nervous System, 97, 100-103, 119
Nitroglycerin, 45, 151

Nocturia, 91, 110
Nursing Homes, 4-5, 11-17

Official name (of a drug), 69, 72
Ointment, 36, 41, 171
Oliguria, 91, 110
Opthalmic, 145
Optimal dose, 35, 42
Oral Medications (Procedure for Administration of), 166-170, 197-198
Organ, 91, 96
Orinase, 147, 187-188
Orthopnea, 91, 108
Osteoporosis, 91
Otic, 73
Otitis media, 91, 116
Ovaries, 108-109, 125
Overdose, 36, 43
Over-the-counter drug (OTC), 2, 6, 8

Pacemaker, 91, 104
Pacreas, 111, 113-114, 124-125
Pap smear, 109
Paralysis, 92, 100-102
Paraprofessional, 3
Parathyroid glands, 113-114, 125
Parenteral, 36, 47-48
Paresis, 92, 101
Parkinson's Disease, 92, 102
Pathology, 92, 95
Patient Consultation, 74
Pedicalicide/Scabicide, 77, 153
Penetrating injuries, 101-102
Penicillin, 79, 144
Peripheral Nervous System, 92, 100, 101
Peristalsis, 92, 111
Petrolatum, 36
Pharmacodynamics, 92, 128
Pharmacology, 74, 95, 128
Pharmacy, (pharmacist), 7, 8, 11, 13, 15-16, 19, 22-23, 129
Phenobarbitol, 2, 146
Physician's Desk Reference (PDR), 16, 69, 71, 73, 75-76, 79
Physiology, 92, 95, 97
Pill, 36, 41
Pituitary gland, 113, 125
Placebo, 32, 39

Platelets, 92, 104
Pleurisy, 92, 108
Pneumonia, 92, 95, 107
Polypharmacy, 139
Polyuria, 92, 113
Poison, 2, 14
Polymyxin , 145
Potassium, (e.g. supplements), 77, 153
Precaution(s), 69, 71, 74, 139
Prescription, 7, 55, 57
Proof-Of-Use System, 2, 13, 15
Prostate, 109, 122-123
Proteinuria, 92, 110
Proventil, 150
Psoriasis, 92, 114
Pulse, 92, 104

Quadriceps, 99, 118

Rectal Medications (Procedure to Administer), 46, 172-173, 207-208
Record of Medications and Narcotics, 15-16
References (medication), 16
Refusal of Medication and/or Treatment, 210
Registered nurse, 193
Regulation (general considerations), 2, 3
Reproductive System, 97, 108-109, 122
Respiratory System, 97, 107-108, 121
Retention of health record, 25
Rights, Five in Administering Medications, 187
Roman numerals/Arabic number, 53, 62
Routes of medication administration, (Diagrams), 45-48, 60
Robitussin, 40, 77, 151

Saliva, 36
Scheduled drugs, 1, 6, 7, 29
Score (or scoring), 36, 41
Sedative, 2, 13, 77
Sedative/Hypnotic, 77, 154
Self-administration of medications, 11, 19, 26, 210
Seizures, 102, 146
Septra, 144
Side effects (of drugs), 36, 43, 69, 71, 74, 78-82, 137, 139, 142-154
Sign, 92, 95
Sinemet, 148

Skeletal System, 97, 99, 117
Skilled Facility, 11-12
Skin, 97, 114-115, 126
Solid preparation (of a drug), 39, 41
Soluble, 36
Solution, 36, 39
Spansule, 36, 41
Special Considerations of Drug Administration, 69, 79, 80-81, 142-154
Spirit, 40
Sphygmomanometer, 92, 104
Spray, 36, 40
Standing order, 57
Sterility/Sterilization 14-15, 36, 170, 174, 175, 177
Steroid, 77
Stimulant, 2, 13
Stock supply of legend drugs, 13-14
Stool softener, 152
Storage of medications, 12
Street (slang) name of a drug, 72
Stroke, 92, 95, 101, 106
Subcutaneous, 36, 48, 60, 114, 126
Sublingual, 36, 45, 60, 169
Suppository, 37, 41, 42, 172
Suppository (Procedure to Administer), 172-173, 207-208
Surfax, 152
Suspension, 37, 39-40
Sustained released medication (see time-released)
Symbols (medical), 61
Symptom, 92, 95
Syrup, 37, 40
Synergistic effect, 44
System, 92, 96, 97
Systemic effect(s) of a drug, 37, 44
Systolic pressure, 92, 104

Tablet, 37, 41
Tachycardia, 92, 105-106
Tegretol, 146
Tendon, 92, 99
Tetracycline, 144
Therapeutic effect(s) (of a drug), 37, 42
Thorazine, 41, 77, 149
Thrombocytopenia, 92
Thrombophlebitis, 92, 105
Thrombosis, 92, 105

Thrombus, 93, 105
Thyroid gland, 113-114, 125
Times (e.g. PRN) of medication administration, 60
Time released (sustained) medications, 37, 41, 45
Tincture, 37, 40
Tissues, 92, 96
Tolerance, 37, 43
Topical applications (general), 37, 40, 44, 46, 77
Topical Medications (Procedure for Administration), 170-178, 199-200, 201-202, 203-204, 205-206, 207-208
Trade (name of a drug), 69, 72
Traditional Dose System, 161
Trained Medication Aide (TMA). Name, 3-4
Transcript/Transcription, 2, 11, 19, 161, 180
Troche (lozenge), 37, 41, 169
Tylenol, 142

Unit Dose System, 2, 13, 161-163
United States Pharmacopeia, 8, 9, 69, 72
United States Pharmacopeia/Dispensing Information (USPDI), 16, 69, 71, 72, 74-76, 79
"Unlicensed" personnel, 3, 193
"Untoward effects" (of a drug), 82
Urethra, 47, 108, 110, 122
Urinary system, 97, 110, 123

Vagina, 47, 110, 122, 147
Valium, 29, 72, 77, 79, 80, 143, 154
Valiscore, 154
Vasodilator, 151
Vein(s), 93, 103
Ventolin, 150
Ventricle(s), 93, 103
Viral enteritis, 93, 112
Voluntary nervous system, 100

Warnings (Special Considerations), 69, 75, 80-81, 139
White cells (leukocytes), 93, 104
Worksheets, Unit I: 30-33; Unit II: 49-50; Unit III: 63-67; Unit IV: 85-87; Unit V, Part 1: 131-135; Unit V, Part 2: 155-160.
Written Procedures for Administering Medications, 161-165